OBLICZA DOBROBYTU

Tom VI

OBLICZA DOBROBYTU

Tom VI

Kwidzyn 2024

Redakcja naukowa: dr Katarzyna Strzała-Osuch, prof. PSW

Komitet redakcyjny: dr Beata Pawłowska, dr Katarzyna Strzała-Osuch

Korekta: Sebastian Surendra

Skład: Maciej Torz

Projekt okładki: Julia Drelich

ISBN: 978-83-956346-4-2

Wydawnictwo Powiślańskiej Szkoły Wyższej
ul. 11 Listopada 29, 82-500 Kwidzyn

Druk: Normex,
ul. Geodetów 8, 80-289 Gdańsk

Spis treści

Wprowadzenie

Współczesne społeczeństwa są nieustannie konfrontowane z wyzwaniami dotyczącymi dobrobytu jednostek i społeczności. Zagadnienia związane ze zdrowiem i ekonomią stają się coraz bardziej złożone, wymagając interdyscyplinarnego podejścia w celu pełnego zrozumienia ich mechanizmów i skutków. Monografia *Oblicza dobrobytu* stanowi próbę połączenia różnorodnych perspektyw naukowych, w tym nauk medycznych, nauk o zdrowiu oraz nauk ekonomicznych, aby zgłębić złożone relacje między zdrowiem a dobrobytem społecznym.

Współczesne badania w dziedzinie zdrowia i ekonomii skupiają się nie tylko na ocenie kondycji fizycznej jednostki, lecz również na jej dobrostanie psychicznym, jakości życia oraz dostępie do opieki zdrowotnej. Rozumienie tych zagadnień wymaga spojrzenia na zdrowie jednostki z różnych perspektyw, uwzględniając zarówno czynniki biologiczne i środowiskowe, jak i aspekty społeczne i ekonomiczne. Ponadto, analiza wpływu tych czynników na dobrobyt społeczny staje się kluczowym elementem w formułowaniu skutecznych polityk publicznych.

W książce przyjęto interdyscyplinarne podejście, które pozwoliło na pogłębione zbadanie wielu aspektów związanych zarówno ze zdrowiem jednostki, jak i z dobrobytem społecznym. Autorzy dokonują analizy makroekonomicznych uwarunkowań zdrowia, jak i mikroekonomicznych determinant zdrowia jednostki. Przyglądają się również zróżnicowaniu dostępu do opieki zdrowotnej w kontekście nierówności społecznych, geograficznych oraz ekonomicznych nie tylko w kontekście globalnym, lecz również w oparciu o poszczególne jednostki chorobowe.

Niezwykle istotnym aspektem poruszanym w książce jest rola ekonomii zdrowia w kształtowaniu systemów opieki zdrowotnej oraz finansowania działań na rzecz poprawy zdrowia społeczeństwa. Analizowane są różne modele organizacji systemów opieki zdrowotnej, ich efektywność oraz wyzwania związane z finansowaniem i dostępnością dla wszystkich grup społecznych.

Ponadto monografia podejmuje tematykę związaną z globalnymi wyzwaniami zdrowotnymi, takimi jak pandemie, epidemiologie czy choroby przewlekłe. Autorzy dokonują analizy wpływu tych zagrożeń na stabilność gospodarczą i społeczną, identyfikując strategie zarządzania kryzysowego oraz długoterminowe plany adaptacyjne.

W kontekście zmieniającego się świata, w którym starzenie się populacji, urbanizacja, katastrofy o podłożu epidemiologicznym, konflikty zbrojne czy zmiany stylu życia i globalizacja mają istotny wpływ na zdrowie i dobrobyt społeczeństwa, istnieje pilna potrzeba interdyscyplinarnej dyskusji oraz opracowania kompleksowych strategii na rzecz poprawy jakości życia i zdrowia jednostki.

Oblicza dobrobytu stanowią zbiór różnorodnych perspektyw i analiz, które mają na celu poszerzenie wiedzy na temat zdrowia jednostki, a także zdrowia poszczególnych środowisk, relacji między zdrowiem a gospodarką, a także wskazanie praktycznych rozwiązań i strategii, które mogą przyczynić się do promowania dobrobytu jednostki i społeczeństwa jako całości.

Wierzę, że niniejsza monografia przyczyni się do rozwoju interdyscyplinarnych badań oraz do formułowania skutecznych polityk publicznych, procedur medycznych, które będą sprzyjać poprawie zdrowia i dobrobytu społecznego. Oddając książkę w ręce czytelników, jestem przekonana, że zawarte w niej opracowania będą przydatne i jednocześnie inspirujące do dalszych dyskusji i badań związanych z dobrobytem społecznym. Mam także nadzieję, że stanowią motywację do pogłębionej dyskusji środowiska medycznego, społecznego i ekonomicznego, przyczyniając się do stworzenia platformy wymiany poglądów przydatnych również przy opracowywaniu zaleceń dla polityki gospodarczej i społecznej.

dr Katarzyna Strzała-Osuch, prof. PSW

Oksana Chernenko*, Oksana Koshova*, Tetyana Parfonova*,
Olena Olhovska*, Yuriy Oleksiychuk*

Assessment of ecological safety of region in the form of a model of the multicriterial optimization problem

Nowadays the relevance of research the correlation of natural and social factors in human life caused by increasing importance of the problem of environmental safety in modern society. In recent years, a sufficiently large number of materials devoted to the problem of balancing the economy and ecology have been published. For example, in work [Bagrov 2002] the role of regional geopolitics in the development of the concept of sustainable development of the region is highlighted; in work [Khlobystov 2004] considered problem of ensuring environmental safety in the conditions of transformation of the economy of Ukraine.

This problem concerns the study of specialists from different countries, however, the problem of modeling the environmental safety of the region's functioning has not been considered in the literature.

Thus, the problem of constructing a model of the region's functioning remains relevant, taking into account the technogenic load on the environment and the rational use of natural resources.

We will consider the functioning of the region for one year in order to assess its environmental safety.

Ecological safety is the achievement of conditions and a level of balanced coexistence of the natural environment and human economic activity, when the load on the environment does not exceed the level of its ability to influence [Maslennikova 2007]

* Poltava University of Economics and Trade, Ukraine

Ecological assessment is a process of systematic analysis and evaluation of the environmental consequences of a proposed activity, consultations with stakeholders, and consideration of the results of this analysis and consultations in the planning, design, approval and implementation of this activity [Cherp 2000].

The system of criteria for assessing the environmental safety of the region is focused on assessing the environmental safety of individual industries. Since it is in the region that industrial enterprises are concentrated, mining complex, as well as agriculture, in particular, crop and livestock production, are developed.

As a result of the activity of industrial agglomerations, the lithosphere, hydrosphere and atmosphere are polluted and the biosphere is harmed. The functioning of the region is also impossible without using natural and extracted resources.

To analyze and build the model of functioning of the region, we introduce the following designations: x_i – the volume of manufactured i-th products in the region (tons), X – the set of manufactured products; y_i-the amount of mined i-th fossil mineral (tons), Y – the set of all fossil minerals; z_i is the volume of the i-th crop grown (tons), Z is the set of all crops; v_i is the volume of the fed i-th type of livestock (tons), V is the set of all animals. J_1 – set of pollutants for the industrial sector (enterprises and mining complex); J_6 – set of pollutants for agricultural production; I_1 – the number of industrial enterprises; I_2 – the number of mining sites in the region.

The following assumptions are made in the work:

1) pollution is defined as use, in particular, if 1 cubic meter of air is polluted, it is considered as used;

2) one enterprise can specialize in the production of different products, and the same product is produced by different enterprises. A similar assumption holds for livestock production;

3) one crop can be sown in one field and the same crop can be sown in different fields.

Building a mathematical model of the problem

Evaluation of the activities of industrial enterprises in the region on the use of its resources.

1. Air pollution. The concentration of a C_{jk}^{ent} pollutant j in the air in the direction of the wind (wind speed U, m/s) at a distance b from the k-th industrial agglomeration is calculated by the formula [Shvartsman 2004]:

$$C_{jk}^{ent} = \frac{\sum_{i \in X} m_{ji}^{1} x_i}{\left[\left(\frac{l_k^{ent}}{2} + b\right) 2tg\left(5{,}5U^{-0{,}4}\right) + h_k^{ent}\right] H \cdot U}, \tag{1}$$

where m_{ji}^{1} is the intensity of emissions of the j-th substance for the production of a unit of the *i*-th product per unit of time, l_k^{ent}, h_k^{ent} is the length and width of the emission zone of the k-th industrial enterprise; H is the height of the layer of surface atmospheric circulation. Formula (1) allows you to calculate the concentration of a particular pollutant *j*, which is released by a separate enterprise. $\sum_{i \in X} m_{ji}^{1} x_i$ – the sum of emissions of the *j*-th substance for all products or part of products with X, which is produced by some enterprise.

Assumption 1. The dependence of the intensity of pollutant emissions on the volume of production is linear.

Assumption 2. Air pollution by the industrial sector is estimated by comparing the calculated concentration and the maximum allowable concentration (MAC), which is documented for each individual enterprise and mining complex. A similar assumption holds for the assessment of water pollution. Therefore, the sum of the MAC of the *j*-th substance from all industrial facilities does not exceed the MAC *j* of the th substance in the air.

Assumption 3. For the assessing of air and water pollution we consider the point in time when emissions have spread in such a way that they can be considered constant in time and space.

Compare C_{jk}^{ent} calculated by (1) with the maximum allowable C_{jk}^{MPC} for the *j*-th substance for each enterprise in the region. We single out J_2 – a set of pollutants from industrial enterprises, the concentration of which in the air exceeds the norm.

Let's write the function in the cost ratio, which determines the penalty:

$$\sum_{j \in J_2} k_j^{1} (C_{jk}^{\text{ent}} - C_{jk}^{MPC}), \tag{2}$$

where k_j^{1} is the penalty coefficient for exceeding the MPC of pollutants in the air. Here and further in the work: if there is no excess of the MPC, the penalty coefficient is equal to zero. Relation (2) holds for each enterprise. Considering the entire industrial complex of the region, (2) is written as follows:

$$\sum_{k \in I_1} \sum_{j \in J_2} k_j^{1} (C_{jk}^{\text{ent}} - C_{jk}^{MPC}) \rightarrow min. \tag{3}$$

On the other hand, we summarize the concentrations of all pollutants $j \in J_1$ for each enterprise and compare the resulting amount and the amount C_{jk}^{MPC}:

$$\sum_{j\in J_1} C_{jk}^{n} \le \sum_{j\in J_1} C_{jk}^{MPC} \forall k \in I_1 \tag{4}$$

For those enterprises $k \in I_1$ for which (4) is not fulfilled, we consider the amount of used (contaminated) air, namely, the $\sum_{k\in I_1} l_k^{\text{ent}} h_k^{\text{ent}} H$ used air for $\forall k \in I_1$, since (4) is not fulfilled.

2. Water pollution. On the one hand, denoting η_i – the amount of water used for the production of a unit i-th of output, the volume of water used in the industrial sector of the region is equal to:

$$\sum_{i\in X} \eta_i x_i \tag{5}$$

On the other hand, denoting $D_{jk}^{x_i}$ – the volume of the release of the j-th substance into the water during the production of a unit of the i-th product, we obtain the volume of polluted water as a result of the functioning of the k-th enterprise, $k \in I_1$:

$$\sum_{i\in X} D_{jk}^{x_i} x_i = D_{jk}^{ent} \tag{6}$$

We compare (6) and D_{jk}^{MPC} – MPC of the j-th substance in water. We single out J_3 – a set of pollutants from industrial enterprises, the concentration of which in water exceeds the norm.

The function in the cost ratio, which determines the penalty, will be written as follows:

$$\sum_{j\in J_3} k_j^2 \left(D_{jk}^{\text{ent}} - D_{jk}^{MPC}\right) \tag{7}$$

where k_j^2 – penalty coefficient for exceeding the MPC of pollutants in water. Taking into account the entire industrial complex of the region, (7) will be written as follows:

$$\sum_{k\in I_1} \sum_{j\in J_3} k_j^2 \left(D_{jk}^{\text{ent}} - D_{jk}^{MPC}\right) \to min. \tag{8}$$

3. Used energy is calculated by the formula:

$$\sum_{i\in X} p_i x_i \tag{9}$$

where p_i is the amount of used energy to produce a unit of the i-th product.

The model of functioning of industrial enterprises of the region will be written as follows:

$$\sum_{i\in X} m_i x_i \to max, \tag{10}$$

$$\sum_{k\in I_1}\sum_{j\in J_2} k_j^1 (C_{jk}^{\text{ent}} - C_{jk}^{MPC}) + \sum_{k\in I_1}\sum_{j\in J_3} k_j^2 (D_{jk}^{\text{ent}} - D_{jk}^{MPC}) \to min \tag{11}$$

given that

$$a_i \le x_i \; \forall i \in X \tag{12}$$

where m_i is the profit from the production of a unit of the i-th product, a_i is the need for the i-th product.

Evaluation of the activity of the mining industry in the region in terms of using its resources.

1. Air pollution. Similar considerations allow us to write:

$$\sum_{k\in I_2}\sum_{j\in J_4} k_j^1 (C_{jk}^{mc} - C_{jk}^{MPC}) \to min$$

where C_{jk}^{mc} – the concentration of the j-th pollutant in the air from the activity of the k-th mining complex, J_4 is the set of pollutants from the activity of the mining complex, the concentration of which in the air exceeds the norm.

On the other hand, we summarize the concentrations of all pollutants, $j \in J_1$ for each industrial site and compare the amount received and the amount C_{jk}^{MPC}:

$$\sum_{j\in J_1} C_{jk}^{mc} \le \sum_{j\in J_1} C_{jk}^{MPC} \; \forall k \in I_2. \tag{13}$$

For those mining complexes $k \in I_2$, for which (13) is not fulfilled, we calculate the amount of used air using the formula

$$\sum_{k\in I_2} l_k^{mc} h_k^{mc} H \tag{14}$$

where l_k^{mc}, h_k^{mc} – the length and width of the emission zone of the k-th mining complex; H is the height of the layer of surface atmospheric circulation.

2. Water pollution is calculated by the formula:

$$\sum_{i\in Y} \beta_i y_i \tag{15}$$

where β_i is the amount of used (contaminated) water for extracting a unit of volume for the i-th fossil mineral. On the other hand, we write the function in terms of cost, which determines the penalty

$$\sum_{k\in I_2}\sum_{j\in J_5} k_j^2 (D_{jk}^{mc} - D_{jk}^{MPC}) \to min, \tag{16}$$

where $D_{jk}^{mc} = \sum_{i\in Y} D_{jk}^{yi} y_i$ – the volume of polluted water as a result of the functioning of the k-th mining complex, J_5 – a set of pollutants from the activities of the mining complex, the concentration of which in the water exceeds the norm.

3. Energy usage is calculated by the formula:

$$\sum_{i\in Y} \gamma_i y_i \tag{17}$$

where γ_i – the amount of used energy for extracting 1 ton of i-th fossil mineral.

The functioning of the mining complex of the region can be described by the model:

$$\sum_{i\in Y} n_i y_i \to max \tag{18}$$

$$\sum_{k\in I_2}\sum_{j\in J_4} k_j^1 (C_{jk}^{mc} - C_{jk}^{MPC}) + \sum_{k\in I_2}\sum_{j\in J_5} k_j^2 (D_{jk}^{mc} - D_{jk}^{MPC}) \to min \tag{19}$$

given that

$$b_i \le y_i \le B_i,\ i \in Y, \tag{20}$$

where b_i is the quantitative demand for the i-th fossil mineral; B_i – the maximum possible amount of extraction of the i-th mineral; n_i – profit from the extraction of a unit of the i-th fossil mineral.

Assessment of using of the region's resources by the vegetable sector of agriculture.

1. Air pollution is calculated by the formula:

$$\sum_{i\in Z} \delta_i z_i \tag{21}$$

where δ_i is the total amount of used air to grow a unit of the i-th crop.

On the other hand, $C_j^v z_i \le C_j^{MPC}$, $j \in J_6$, where C_j^v is the volume of emission of the j-th pollutant into the air when growing a unit of mass for the i-th crop. Thinking similarly to assessing of activity for the industrial sector of the region, we write

down the limits for all pollutants that enter the air as a result of sowing and growing crops:

$$\sum_{i\in Z}\sum_{j\in J_6} C_j^v z_i \le \sum_{j\in J_6} C_j^{MPC} \tag{22}$$

The right side (22) is the MPC of air pollution by the plant industry of agriculture (can be calculated from the value C_j^{MPC} in the air as a percentage of the technogenic load of the plant industry of agriculture on the environment).

2. Water pollution is calculated by the formula:

$$\sum_{i\in Z} \phi_i z_i \tag{23}$$

where ϕ_i is the amount of used water to grow a unit of the i-th crop (irrigation, etc.).

On the other hand, $D_j^v z_i \le D_j^{MPC}$, where D_j^v is the volume of the ejection of the j-th pollutant into water when growing a unit mass of the i-th crop. For the region, the assessment of water pollution as a result of the cultivation of grain crops will be written as:

$$\sum_{i\in Z}\sum_{j\in J_6} D_j^v z_i \le \sum_{j\in J_6} D_j^{MPC} \tag{24}$$

3. Using of energy

$$\sum_{i\in Z} \varphi_i z_i \tag{25}$$

where φ_i is the amount of used energy to grow a unit of mass for the i-th crop.

The functioning of the plant branch of agriculture can be described by the model:

$$\sum_{i\in Z} k_i z_i \to max \tag{26}$$

where k_i is the profit from 1 ton of i-th grown culture by the conditions:

$$z_i \ge c_i,\ \forall i \in Z, \tag{27}$$

$$\sum_{i\in Z} s_i z_i < S_{max}^v \tag{28}$$

and when the constraints (22), (24) are met, where c_i is the quantitative requirement for the i-th crop; s_i – the required area for growing a unit of the i-th crop, S_{max}^v – the maximum area that is allocated for sowing.

Assessment of resources using by the livestock sector of agriculture in the region.

1. Air pollution is calculated by the formula:

$$\sum_{i \in V} \alpha_i v_i \tag{29}$$

where α_i is the total amount of air used for a one-ton increasing for the mass of an animal of the i-th species (operation of equipment, evaporation of wastewater).

2. Water pollution is calculated by the formula:

$$\sum_{i \in V} \mu_i v_i \tag{30}$$

where μ_i is the amount of used water for a one-ton mass increase of an animal of the i-th species (runoff from livestock complexes).

3. Energy usage is calculated as follows:

$$\sum_{i \in V} \sigma_i v_i \tag{31}$$

where σ_i is the amount of used energy for a one-ton mass increase of an animal of the i-th species, $i \in V$.

4. Use of crop production as feed

$$\sum_{i \in Z_1} z_i \geq \sum_{j \in V} r_j v_j \tag{32}$$

where r_j is the volume of needed crops to grow a ton of animal of the i-th species, Z_1 is the set of fodder crops.

The functioning of the livestock sector can be described by the model:

$$\sum_{i \in V} p_i v_i \rightarrow max \tag{33}$$

where p_i is the profit from rearing a unit of mass for the i-th animal species under with conditions:

$$d_i \leq v_i, \forall i \in V, \tag{34}$$

$$\sum_{i \in V} s_i v_i < S_{max}^{sr} \tag{35}$$

and restriction (32), where d_i is the quantitative need for the i-th species of animals; s_i – the required area for a unit of mass of the i-th species of animals, S^{sr}_{max} – the maximum area that is allocated for the livestock sector.

Integral assessment of the ecological state for the territory of region.

In general, for the region, we write the restriction for the using of resources (air, water, energy) in the form

$$H^r_f \le K^r, \tag{36}$$

where H^r_f is an indicator of the actual state of the r-th component of the natural environment (its usage), $K^r$is an indicator of a critical state (norm). In particular, we have the following restrictions:

a) for the use of air

$$\sum_{k\in I_1} l^{\text{ent}}_k h^{\text{ent}}_k H + \sum_{k\in I_2} l^{mc}_k h^{mc}_k H + \sum_{i\in Z} \delta_i z_i + \sum_{i\in V} \alpha_i v_i + A^{n.u.} \le A, \tag{37}$$

$$\sum_{j\in J_1} C^{\text{ent}}_{jk} > \sum_{j\in J_1} C^{MPC}_{jk} \;\forall\; k \in I_1,$$

$$\sum_{j\in J_1} C^{mc}_{jk} > \sum_{j\in J_1} C^{MPC}_{jk} \;\forall\; k \in I_2,$$

where $A^{n.u.}$ – non-industrial of air usage (population, transport, etc.); A – a constant that determines the possibility of air recovery (determined by the number of plantings; treatment facilities, etc.);

b) for the use of water

$$\sum_{i\in X} \eta_i x_i + \sum_{i\in Y} \beta_i y_i + \sum_{i\in Z} \phi_i z_i + \sum_{i\in V} \mu_i v_i + W^{n.u.} \le W \tag{38}$$

where $W^{n.u.}$ is the non-industrial of water use, W is the quantitative constant of the possible use of water in the region;

c) for energy usage

$$\sum_{i\in X} p_i x_i + \sum_{i\in Y} \gamma_i y_i + \sum_{i\in Z} \varphi_i z_i + \sum_{i\in V} \sigma_i v_i + E^{n.u.} \le E \tag{39}$$

$E^{n.u.}$ – non-industrial use of energy, E – quantitative constant of the energy available for use in the region. The remaining components of relations (37)-(39) were considered earlier (see (5), (9), (14), (15), (21), (23), (25), (29)-(31)).

Using the work [Kopach 2009], we will determine the integral indicator of the degradation for the ecological state of territory of the region:

$$P = \sum_{r=1}^{3} \left(a_r \ln \left(1 - \frac{H_f^r - K^r}{K^r} \right) + c_r \right) \omega_r \tag{40}$$

where a_r, c_r – the coefficients of the normalization function, ω_r – the corresponding weight coefficients, which are due to the relative advantage and established importance for ensuring the stability of the functioning of the components of the natural environment as a whole, $\sum_{r=1}^{t} \omega_r = 1$, where t is the number of components of the environment [Kopach 2009]. The coefficients a_r, c_r, ω_r are proposed to be determined by experts.

Substituting (37)-(39) into (40), we obtain the following function:

$$\omega_1 \left(a_1 \ln \left(1 - \frac{H_f^{air} - K^{air}}{K^{air}} \right) + c_1 \right) + \omega_2 \left(a_2 \ln \left(1 - \frac{H_f^{water} - K^{water}}{K^{water}} \right) + c_2 \right) +$$

$$+ \omega_3 \left(a_3 \ln \left(1 - \frac{H_f^{\text{energy}} - K^{\text{energy}}}{K^{\text{energy}}} \right) + c_3 \right) \rightarrow min \tag{41}$$

Separately, we evaluate the environmental damage for the region from soil pollution. To do this, we use the formula [Lohvyn 2008]:

$$S = M \cdot S' \cdot k_z, \tag{42}$$

where S is the environmental damage from soil pollution, M is the mass of emissions into the soil (t/h), S' is the specific damage from pollution of 1 ton of soil (UAH/t), k_z is the land resource value coefficient.

Let's divide the region into territorial units according to the value of land resources $z \in N$, taking into account waste. The ratio of the mass of finished products and waste during production is determined by experts. For example, we will assume that during the extraction of minerals and smelting of metals, 50% is waste [Vasiukova 2009], then the waste of the industrial complex (heavy and light industry) will be estimated as follows: $0{,}5(x_i + y_i)$. When processing agricultural products, on average, the output of finished products is 30% of the mass of processed agricultural raw materials [Cherevko 1995], the rest is waste and by-products, that is, $0{,}7(z_i + v_i)$.

Thus, the mass of waste is $0{,}5(x_i + y_i) + 0{,}7(z_i + v_i)$. Environmental damage to the region from soil pollution will be written as follows:

$$\sum_{z \in N} (0{,}5(x_i + y_i) + 0{,}7(z_i + v_i))\, S' \cdot k_z \rightarrow min \tag{43}$$

Specific harm S' can be clarified by taking into account the degree of harmfulness of emissions to humans and the environment through the introduction of weighting factors λ_q (determined by experts) $\sum_{q=1}^{4} \lambda_q = 1$, where it q determines the hazard class of the waste: extremely hazardous, very hazardous, moderate and low hazardous [Cherevko 1995].

Let us evaluate the ecological and economic efficiency of regional nature management according to the formula [Lohvyn 2008]:

$$E_r = \frac{C_c - C_v}{E_c + E_s K} \tag{44}$$

where E_r is the efficiency of regional nature management; C_c – the cost of environmentally friendly products of enterprises in the region (non-waste and low-waste technologies); C_v – the cost of products that are produced in violation of environmental standards; E_c – current costs for the protection, restoration and exploitation of natural resources; K – normative coefficient of efficiency of environmental costs; E_s – short-term costs for the protection and restoration of the natural environment.

For the proposed model of the ecological safety of the region and taking into account that agricultural production is low-waste (we refer to large livestock complexes as production), we write down the following function

$$\frac{\sum_{i \in V} p_i x_i + \sum_{i \in Z} k_i z_i - \sum_{i \in X} m_i x_i - \sum_{i \in Y} n_i y_i}{E_c + E_s K} \rightarrow max \tag{45}$$

Taking into account the above material, the model of ecological safety of production in the region will be written as follows: optimize criteria (10), (11), (18), (19), (26), (33), (41), (43), (45) with conditions (4), (12), (13), (20), (22), (24), (27), (28), (32), (34), (35).

In the simplest case, we have a multicriterial linear programming problem. Its solution can be found using the method of constraints by reducing the criteria to dimensionless quantities.

The paper considers the problem of balancing the economy and ecology at the regional level and builds its mathematical model. The prospect for the research includes study the obtained mathematical model and program implementation of its solution.

Bibliography

Bagrov N., 2002, *Regional geopolitics of sustainable development*, Kyiv.

Cherevko H., 1995, *Environmental economics*, Lviv.

Cherp O., 2000, *Environmental assessment and environmental expertise*, Ekolain.

Hvesik M., 2009, *Distribution of productive forces and regional economy*, Kyiv.

Khlobystov Y., 2004, *Environmental safety of the transformation economy, Chornobylinterinform*, Kyiv.

Kopach P., 2009, *Quantitative assessment of ecological safety of mining areas,* vol. 12, pp. 48-53.

Kravtsiv E., 2020, *Environmental security in European countries: methods of economic regulation and experience for Ukraine*, Lviv.

Lohvyn M., 2008, *Regional economy*, Poltava.

Maslennikova I., 2007, *Management of environmental safety and rational use of natural resources*, St. Petersburg.

Shvartsman V., 2004, *Improving of environmental safety by reducing acid formation in the atmosphere in man-made areas of the mining and metallurgical complex*, Dnipro.

Sokur M., 2020, *Ecologocal safety and economics.* PE Shcherbatykh, Kremenchuk.

Vasiukova H., 2009, *Ecology*, Kyiv.

Summary

Assessment of ecological safety of region in the form of a model of the multicriterial optimization problem

The issue of ecological safety of production in the regional level has been considered in this article. A mathematical model of the functioning of the region has been constructed, in the view of economic growth and the potential of the environment in terms of the possibilities of its usage.

Keywords: ecological safety, mathematical model, multicriterial optimization problem, mining industry, air and water pollution.

JEL Classification: C 60, C 61, Q 32.

Samya Mohellebi Salmi*

ICT in health and Covid19: the experience of Algeria

Introduction

Traditionally, communication and information sharing methods in healthcare involved face-to-face interaction such as in-person consultations, meetings and conferences. They also involved written documentation such as paper-based forms, charts, and medical records to document patient information, medical history, diagnoses, and treatment plans. This includes handwritten notes, prescriptions, lab requisitions, and referral letters.In addition, some more advanced methods were used such as phone calls and documentsfaxing.

While these traditional methods have served as the backbone of healthcare communication, the integration of Information and Communication Technology (ICT) has increasingly supplemented or replaced them with more efficient and digitized alternatives.ICT in healthcare offers several advantages over traditional methods such as accessibility, real-time information sharing, enhanced communication, data management,decision support systems, telemedicine, remote monitoring and a lot of other advantages.

ICTplays a crucial role in healthcare as it revolutionized the way medical professionals provide care and manage health information. Here are some key importance of ICT in healthcare:

Efficient Information Management: ICT enables the digitalization, storage, and retrieval of vast amounts of patient health records and medical data. Electronic Health

* Mouloud Mammeri University Tizi-Ouzou, ALGERIA

Records (EHRs) allow healthcare providers to access and update patient information in real-time, facilitating faster and more accurate diagnoses and treatment decisions.

Enhanced Communication and Collaboration: ICT tools such as email, teleconferencing, and videoconferencing enable healthcare professionals to communicate and collaborate more effectively. This is particularly important in situations where distance or time constraints limit face-to-face interactions. It improves coordination among healthcare teams, leading to better patient outcomes.

Telemedicine and Remote Monitoring: ICT has enabled the growth of telemedicine, which allows patients to receive medical consultations and follow-ups remotely, reducing the need for in-person visits. Remote monitoring devices and wearable technology enable healthcare providers to monitor patients' vital signs and health conditions from a distance, providing timely interventions and personalized care.

Decision Support Systems: ICT provides access to clinical decision support systems, which assist healthcare professionals in making evidence-based decisions. These systems utilize

medical databases, algorithms, and guidelines to analyze patient data and provide recommendations for diagnosis, treatment plans, and medication management, leading to improved accuracy and efficiency in decision-making.

Health Education and Awareness: ICT platforms, including websites, mobile applications, and online forums, serve as valuable sources of health education and awareness. They provide accessible information on various medical conditions, preventive measures, healthy lifestyle choices, and promote patient engagement and empowerment.

Research and Data Analysis: ICT facilitates large-scale data collection, storage, and analysis, enabling researchers and policymakers to identify trends, patterns, and insights. This data-driven approach helps in advancing medical research, identifying public health risks, and developing evidence-based healthcare policies.

Improved Healthcare Access: ICT has the potential to bridge geographical barriers and improve access to healthcare services, especially in underserved or remote areas. Telemedicine, telehealth, and mobile health initiatives enable patients to connect with healthcare professionals regardless of their physical location, enhancing healthcare accessibility and equity.

Efficiency and Cost Savings: By streamlining administrative processes, reducing paperwork, and automating routine tasks, ICT helps healthcare organizations improve operational efficiency and reduce costs. It also minimizes medical errors, duplicate tests, and unnecessary procedures, resulting in better resource utilization and cost savings.

Overall, ICT in healthcare has the potential to transform the delivery of care, improve patient outcomes, enhance communication and collaboration, and promote preventive measures and public health initiatives. It is a powerful tool that continues to reshape and advance the healthcare industry.

It's important to note that while ICT offers numerous benefits, traditional methods still have their place in healthcare, especially for certain procedures and situations that require in-person examinations or interventions. The optimal approach often involves a combination of both ICT and traditional methods, depending on the specific healthcare needs and circumstances.

Healthcare System in Algeria

Healthcare in Algeria is a significant aspect of the country's social infrastructure. Algeria has made considerable progress in improving its healthcare system over the years, aiming to provide accessible and affordable healthcare services to its population. Unlike a lot of developed countries, Algeria manages to proudly provide avery affordable healthcare to its population and some of the key points about healthcare in Algeria are:

Healthcare System: The healthcare system in Algeria follows a mix of public and private sectors. The Ministry of Health, Population, and Hospital Reform is responsible for overseeing the healthcare sector and formulating policies. The system provides universal healthcare coverage to Algerian citizens.

Healthcare Infrastructure: Algeria has a well-developed healthcare infrastructure, with hospitals, clinics, and healthcare centers located across the country. Major cities have tertiary care hospitals, while smaller towns and rural areas have primary and secondary healthcare facilities.

Primary Healthcare: Primary healthcare services play a crucial role in Algeria's healthcare system. Primary healthcare centers are the first point of contact for individuals seeking medical care. These centers provide preventive care, health education, and basic medical treatments.

Health Workforce: Algeria has a significant number of healthcare professionals, including doctors, nurses, pharmacists, and paramedics. The country has made efforts to train and retain healthcare workers, although some challenges persist, such as geographic distribution disparities between urban and rural areas.

Health Insurance: The National Social Security Fund (CNAS) and the National Retirement Fund for Workers in the Public Service (CNR) are the main health ins-

urance schemes in Algeria. These schemes provide coverage for medical treatments, hospitalization, and medications, among other services.

Healthcare Challenges: Despite improvements, the healthcare sector in Algeria faces various challenges. Some of the key challenges include unequal distribution of healthcare resources between urban and rural areas, long waiting times for specialized care, limited access to certain medical technologies, and the need for further investments in healthcare infrastructure.

Health Programs and Initiatives: The Algerian government has implemented several health programs and initiatives to address healthcare challenges and improve healthcare delivery. These include disease prevention and control programs, vaccination campaigns, maternal and child health programs, and initiatives to combat non-communicable diseases.

Traditional Medicine: Algeria also recognizes traditional medicine as part of its healthcare system. Traditional healers, known as "Tabibs," play a role in providing healthcare services, particularly in rural areas. The government has taken steps to regulate and integrate traditional medicine into the broader healthcare system.

Pharmaceutical Industry: Algeria has a growing pharmaceutical industry that focuses on domestic production and importation of essential drugs. The country has taken measures to ensure the availability of affordable medications for its population.

The modernization of healthcare in Algeria is facing challenges for instance lengthy procedures and funding issues, resistance from health professionals, and conflicts between the different actors.

Actors in the integration of ICT in the Algerian healthcare system

In Algeria, the integration of ICTs in the healthcare sector is supported by several actors. These actors include:

Ministry of Health, Population, and Hospital Reform: The Ministry of Health is responsible for formulating policies, implementing strategies, and overseeing the integration of ICT in the healthcare sector. They play a vital role in setting the direction and priorities for ICT implementation.

National Agency of Health Informatics: The National Agency of Health Informatics (AgenceNationaled'InformatiqueSanté, ANIS) is an organization established to promote and coordinate the use of ICT in healthcare. ANIS works closely with healthcare providers, governmental bodies, and other stakeholders to facilitate the integration of health informatics solutions.

Healthcare Providers: Public and private healthcare providers, including hospitals, clinics, and healthcare centers, are key actors in the integration of ICT. They implement and utilize ICT systems and technologies to enhance healthcare delivery, improve patient care, and streamline administrative processes.

ICT Companies and Solution Providers: Companies specializing in healthcare information systems, telemedicine solutions, electronic health records, and other ICT applications play a crucial role in the integration of ICT. They develop and provide the necessary technologies and software solutions for healthcare facilities.

Academic Institutions and Research Centers: Universities, research institutions, and academic departments contribute to the integration of ICT in Algerian healthcare through research, innovation, and education. They conduct studies, provide training, and collaborate with healthcare providers to develop and evaluate ICT solutions.

Professional Associations and Societies: Professional associations and societies related to healthcare informatics and medical technology contribute to the integration of ICT in the healthcare system. They promote knowledge exchange, organize conferences and workshops, and advocate for the adoption of ICT in healthcare.

Governmental Organizations and Agencies: Besides the Ministry of Health, other governmental organizations and agencies, such as the Ministry of Higher Education and Scientific Research, Ministry of Post, Telecommunications, Technology, and Digitalization, and the National Telecommunications Regulatory Authority, may have roles in promoting and regulating the use of ICT in healthcare.

International Organizations and Donors: International organizations and donors, such as the World Health Organization (WHO), United Nations Development Program (UNDP), and various development agencies, may provide support, funding, and expertise to facilitate the integration of ICT in the Algerian healthcare system.

The patient, the focus of the Algerian healthcare system

The Algerian healthcare system is aiming to keep patients:

- Valued,
- Knowledgeable,
- Informed,
- Aware about the benefits of taking care of their health,
- Caring about their health,

- Not dwelling in check their health periodically,
- Getting healthcare at the lowest cost possible while guaranteed better quality.

Algeria's experience in telemedicine

Telemedicine pilot projects in Algeria:

- In Algeria, the "Santé-Algérie" network, which has been operational since January 1991 , can, thanks to the network platform it currently has at its disposal, enable the development in the short term of a number of actions relating to the integration of new information and communication technologies in the sector.
  - Given the size of the Algerian territory, telemedicine would make it possible to shorten distances and avoid the transfer of patients from the south of the country to the north
- The first telemedicine pilot project dates from 2008:
  - The experiment conducted between the hospitals of Birtraria in Algiers and Ouargla in the south of the country was conclusive and was to be extended to other health care centres in other regions.
  - The project was conducted by the Centre for the Development of Advanced Technologies (CDTA).
- In 2011, the second telemedicine project was officially launched between the Bab El Oued University Hospital (Maillot) and the Laghouat Hospital,
  - A medical team from the hospital of Laghouat presented six cases of patients suffering from different pathologies who received guidance from the specialist professors of the CHU of Bab El Oued on care and follow-up.
  - The technical support was acquired by the CDTA and consists of six VSAT stations acquired from Algérietélécom satellite (ATS) with a bandwidth of one megabit, used for six hours per week.
- 2014: CHU of Sétif
- 2015, CHU of Batna, CHU of Tlemcen
- 2016 Tizi-Ouzou University Hospital.
- 24 00 telemedicine sessions were carried out in the field of diagnosis, expertise, treatment, and coordination of the training of doctors and paramedics
- „CHU of T.O: it took a year for the hospital to acquire the necessary equipment, create the space and finally put it into service to be the 4th establishment in the country to be equipped with this technique."

Covid19 crisis and TM in Algeria

1- e-Tabib.dz: online medical consultations:

More than 2,600 teleconsultations have been carried out in three months, i.e. more than 800 teleconsultations per month.

The mobilisation of the following parties:

- ANPT (national agency for the promotion and development of technology parks)
- Algérie télécom, providing high-speed Internet access
- The Chinese giant Haweie, specialising in new technologies and Fortinet Algérie, which provides IT security for medical data.

2- Yassir: online consultations;

the patient gets in touch directly with their doctor in audio and video calls.

3- Beesiha: developed by a group of young entrepreneurs:

It's a teleconsultation tool ,the application allows patients to manage their appointments with their doctor remotely and to consult without any waiting time.

4**- AILA: the Association of Algerian Liberal Internists** providing citizens with all the means to contact doctors via social networks and mobile phones consultations on demand 24 hours a day.

5- Beepdoc: is an application that allows patients to connect to connect with practitioners with whom they can have consultations via videoconference.

Findings

Before COVID19

- It took 8 years to set up 4 telemedicine projects for teleconsultation in public health institutions
- Lengthy procedures and funding
- Resistance from health professionals
- Conflicts between actors

During Covid19

- Less than a month was enough for:
- All public and private health establishments have mobilised the means for remote consultation;
- Consult and benefit not from one opinion but from as many opinions as one wants throughout the country.

Overall conclusion

The motivation and direct involvement of health professionals and other stakeholders is the driving force behind the successful integration of ICT in health

Bibliography

Douba R., S. Laradji S., 2016, réalisation d'une Plateforme de Téléconsultation médicale, mémoire de projet de fin d'études pour obtenir le diplôme de Master en genie-biomédical, spécialité: Télé-Médecine, Université Abou Bakr Belkaid de Tlemcen, 2016,

http://www.yourdictionary.com/vsat (consulté le: 25/09/2020)

http://www.zeblogsante.com/un-nouveau-metier-telemedecin

https://www.liberte-algerie.com/radar/lapplication-de-teleconsultation-beesiha--lancee-349821?fbclid=IwAR1sN3nHyl38bAqm_ru9EenNrorxNnKi1oTojDctYYJY8VV4QWKxibQx8Ic

http://covid19.cipalgerie.com/fr/2020/03/26/cabinets-medicaux-teleconsultation-et-consultation-assurees-24h-24/?fbclid=IwAR32F_NwmbxOByehRGE4LdA7TxEHmqrAp2SjApjyTf3-aAOINtjfjJoyPRk

http://www.depechedekabylie.com/national/161567-le-chu-de-tizi-ouzou-lance-la-telemedecine.html consulté le:07/09/2020.

www.e-Tabib.dz (consulté le 15/09/2020).

www.*Beepdoc.fr*

Summary

The document highlights the integration of information and communication technologies (ICT) in the healthcare system in Algeria. It emphasizes the importance of ICT in the field of healthcare, particularly in terms of efficient information management, improved communication, telemedicine, decision-making, health education, research, and accessibility to healthcare.

Algeria's experience in telemedicine has been marked by several pilot projects. Since 2008, successful telemedicine experiences have been conducted between different healthcare facilities across the country. These projects have brought healthcare services closer to remote regions and provided remote medical consultations.

The COVID-19 crisis has accelerated the adoption of telemedicine in Algeria. Online platforms and applications have been developed to enable remote medical consultations,

thus reducing the risks of virus transmission. These initiatives have seen rapid success, with an increasing number of consultations being conducted remotely.

Keywords: ict, haelth car, telemedicine, covid19 criss, healthcare platform

JEL Classification codes: 033

Katarzyna Strzała-Osuch*, Beata Pawłowska*,
Aleksander Pietuszyński*, Julia Osuch*

Przygotowanie uczelni do realizacji zajęć w formie tradycyjnej, z zachowaniem najwyższych standardów bezpieczeństwa podczas i po ustaniu pandemii SARS-CoV-2, na przykładzie wdrożonych procedur w Powiślańskiej Szkole Wyższej

Wprowadzenie

Problematyka zapewnienia bezpieczeństwa w środowisku akademickim znalazła się od marca 2020 roku w centrum zainteresowania władz uczelni, a także samych członków społeczności akademickiej Powiślańskiej Szkoły Wyższej (dalej: PSW). W wyniku pandemii SARS-CoV-2 może w przestrzeni uczelni dochodzić bowiem do zdarzeń bezpośrednio zagrażających bezpieczeństwu i zdrowiu, a czasem również życiu studentów/kadry akademickiej i pracowników administracyjnych. Właściwa reakcja władz uczelni adekwatna do zaistniałej sytuacji epidemicznej oraz powiadomienie w razie potrzeby stosownych instytucji dają gwarancję, że podjęte działania będą skuteczne – zapewnią bezpieczeństwo. Bezpieczeństwo studentów i pracowników w PSW jest wartością stawianą na pierwszym miejscu przez władze uczelni. Z danych literaturowych wynika, że najczęstszymi przyczynami zdarzeń niepożądanych na uczelniach są:

* Powiślańska Szkoła Wyższa w Kwidzynie

1. brak wiedzy na temat aktualnego stanu i potrzeb uczelni w dziedzinie bezpieczeństwa i higieny, brak przeglądów i pomiarów oraz lekceważenie zagrożeń i nieznajomość przepisów;
2. brak środków finansowych na odpowiednie przygotowanie się na zagrożenia;
3. niewłaściwa organizacja czasu studenta na uczelni: brak zagospodarowania czasu podczas zajęć dydaktycznych i przerw, powodujące u studenta nudę i poszukiwanie sposobów jej odreagowania;
4. ograniczenia przestrzenne: zagęszczenie, nadmiar bodźców, hałas.

Przeszłe i obecne zagrożenie epidemiczne, w tym rekomendacje Głównego Inspektora Sanitarnego oraz Ministerstwa Nauki i Szkolnictwa Wyższego, spowodowały konieczność wprowadzenia szczegółowych regulacji w zakresie identyfikacji ryzyka i potencjalnych zagrożeń zdrowotnych na uczelni, jak również opracowania szczegółowych analiz ryzyka, a także procedur w zakresie minimalizacji ryzyka, zapobieganiu sytuacjom niepożądanym w kontekście możliwości zachorowania i rozprzestrzeniania SARS-CoV-2.

PSW wprowadziła także obowiązkowe badania osób wchodzących na teren uczelni, w tym studentów oraz kadry akademickiej i administracyjnej, które zostaną przedstawione w niniejszym artykule.

Teza: implementacja najwyższych procedur bezpieczeństwa w zakresie przeciwdziałania rozprzestrzenianiu się pandemii COVID-19 w PSW przyczyniła się w sposób wprost proporcjonalny do braku zdarzeń niepożądanych.

Thesis: The implementation of the highest safety procedures to prevent the spread of the covid-19 pandemic in the Powiślański University has contributed in a manner directly proportional to the absence of adverse events

PSW posiada szereg normatywnych aktów wewnętrznych, w tym procedur związanych z zapewnieniem bezpieczeństwa studentom, kadrze akademickiej i administracyjnej, których przestrzeganie jest bezwzględnie wymagane w siedzibie uczelni. Powołano także zespół ds. monitorowania sytuacji epidemicznej, którego kluczowym celem jest tworzenie i określanie w trybie ciągłym i na bieżąco:

a) procedur dotyczących funkcjonowania uczelni w okresie epidemii;
b) ciągłości działania uczelni w obliczu zmieniających się okoliczności zewnętrznych;

c) cyklicznych analiz/szacowania ryzyka, które mogą wystąpić na terenie czelni w związku z epidemią COVID-19;
d) procedur wewnętrznych i szczegółowych działań koniecznych do podejmowania w przypadkach wystąpienia sytuacji niepożądanej, związanej z funkcjonowaniem uczelni w okresie epidemii;
e) zasad przeciwdziałania zagrożeniom i procedur raportowania zdarzeń;
f) zasad stałego monitorowania funkcjonowania uczelni, w tym: prowadzenia kształcenia (z uwzględnieniem kształcenia prowadzonego z wykorzystaniem metod i technik kształcenia na odległość), realizacji projektów europejskich, w tym projektów mobilnościowych i funkcjonowania administracji;
g) aktualnych procedur wewnętrznych i ich dostosowywanie do obowiązujących/ zmieniających się wraz z sytuacją epidemiczną przepisów krajowych.

Ryzyko w tym aspekcie jest definiowane jako prawdopodobieństwo wystąpienia nieszczęśliwego zdarzenia. Zarządzanie ryzykiem to aktywne badanie zdarzeń, które mogą powodować zakażenie u studentów, kadry dydaktycznej i administracyjnej, a także interesariuszy zewnętrznych, oraz opracowywanie i wdrażanie działań likwidujących lub zmniejszających ryzyko. Z perspektywy PSW to monitorowanie i obniżanie ryzyka do poziomu akceptowalnego przez władze uczelni, ale również przez całą społeczność akademicką. Ocena ryzyka umożliwia ustalenie priorytetów dla działania monitoringu sytuacji epidemicznej w PSW powinna być prowadzona nie rzadziej niż co zjazd i częściej w przypadku uzyskania istotnych nieakceptowalnych wyników z monitorowania lub wystąpienia ważnych pod względem epidemiologicznym zmian w lokalnej społeczności.

Zarządzanie ryzykiem możliwości zarażenia SARS-CoV-2 w PSW obejmuje cztery etapy:

1. Identyfikację ryzyka: dotyczy identyfikacji aktywności, które stwarzają ryzyko dla studentów/kadry akademickiej i administracyjnej oraz interesariuszy zewnętrznych. To np. niewłaściwa dezynfekcja sprzętu, niewłaściwe usuwanie odpadów. Dotyczy również dróg transmisji koronawirusa w siedzibie uczelni. Celem działania jest identyfikacja częstych problemów, które mają wpływ na realizację zajęć dydaktycznych w mniejszych i większych grupach studenckich lub rzadkich zdarzeń, ale które mogą mieć poważne konsekwencje zdrowotne. Brane pod uwagę są wyniki monitorowania, ryzyko wpuszczenia do siedziby uczelni studenta/dydaktyka z bezobjawowym/ skąpo objawowym zakażeniem SARS-CoV-2.

2. Analizę ryzyka: w sytuacji, gdy ryzyko zostało zidentyfikowane, prowadzona jest ocena częstości jego występowania i konsekwencji zdrowotnych dla całej społeczności akademickiej i poszczególnych jednostek organizacyjnych. Wykorzystywane są dane z monitorowania zdarzeń niepożądanych oraz wdrożonych procedur. Określane są propozycje działań zapobiegawczych, jakie należy podjąć.

3. Kontrolę ryzyka: wdrożenie działań likwidujących ryzyko lub zmniejszających prawdopodobieństwo jego wystąpienia do poziomu możliwego do zaakceptowania.

4. Monitorowanie ryzyka: ocena efektów wdrożenia działań poprzez monitorowanie sytuacji epidemicznej w PSW i porównanie wyników, monitorowanie wdrożonych procedur oraz audyty realizacji sprzątania i dezynfekcji. Ocena efektów wdrożonych działań naprawczych odbywa się z przekazaniem informacji zwrotnej zainteresowanym osobom, w szczególności władzom uczelni.

Tabela 1. Kategorie ryzyka

Kategorie ryzyka	Przykłady
Możliwość wejścia do siedziby uczelni studenta / dydaktyka / pracownika administracyjnego / interesariusza zewnętrznego zakażonego lub skolonizowanego koronawirusem	Mimo pozytywnej oceny osób wchodzących na teren uczelni dokonywanej przez Zespół kontroli (m.in. wypełnienie Ankiety oraz mierzenie temperatury ciała) istnieje prawdopodobieństwo wejścia osoby zakażonej lub skolonizowanej koronawirusem.
Analiza czynników ryzyka wynikających z niewłaściwego przestrzegania i wykonywania wdrożonych procedur	Zespół kontroli ocenia sposób wykonywania wdrożonych procedur. Analizie poddawany jest sposób wykonywania tych procedur tak, aby ryzyko przeniesienia koronawirusa było jak najmniejsze. Zespół kontroli wizytuje poszczególne jednostki i prowadzi obserwacje wykonywanych procedur. Dotyczy w szczególności: 1. prowadzenia właściwej higieny rąk, 2. przestrzegania zaleceń dotyczących właściwej dezynfekcji sprzętu i środowiska, 3. przestrzegania kluczowych zaleceń dotyczących zachowania w przestrzeni uczelni.
Analiza czynników ryzyka wynikających z monitorowania zakażeń SARS-CoV-2	Zespół prowadzi monitorowanie sytuacji epidemicznej w Polsce w celu uzyskania wyników możliwych do porównania z innymi uczelniami lub opublikowanymi danymi, na tej podstawie szacuje ryzyko wystąpienia możliwości zakażenia związanego z realizacją zajęć dydaktycznych/zajęć praktycznych i praktyk zawodowych i wdraża procedury naprawcze, gdy ryzyko jest zbyt wysokie

Kategorie ryzyka	Przykłady
Analiza czynników ryzyka związanych z infrastrukturą uczelni	Dotyczy w szczególności dostępności sal dydaktycznych, właściwego usytuowania dozowników z alkoholowym preparatem do higieny rąk, liczby studentów w danej sali dydaktycznej/ pracowni umiejętności pielęgniarskich etc., odpowiedniej liczby personelu sprzątającego/dezynfekującego etc.

Źródło: opracowanie własne

Metodyka zarządzania ryzykiem została dostosowana do potrzeb i specyfiki PSW, głównie z powodu licznych możliwości zaistnienia sytuacji niepożądanych, wynikających ze specyfiki funkcjonowania Wydziału Nauk o Zdrowiu. Przyjęto metodykę analizy ryzyka zakładającą, że ryzyko wystąpienia zdarzenia jest iloczynem wystąpienia (Pw) i skutku (Ps):

$$R = Pw \times Ps$$

gdzie:
R – liczba priorytetowa ryzyka,
Pw – współczynnik wystąpienia,
Ps – współczynnik skutków.

Współczynniki Pw, Ps mogą otrzymywać wartości od 1 do 4, zgodnie z tabelą 2.

Tabela 2. Współczynniki ryzyka – wystąpienia i skutków

liczba rodzajów ryzyka	określenie ryzyka	Pw czy odnotowano zjawisko tego typu w skali kraju? czy istnieją i jak funkcjonują mechanizmy i narzędzia kontroli oraz nadzoru?	Ps jakie są skutki dla zainteresowanych (m.in. zdrowotne, wpływ na wizerunek uczelni)?
1	Niskie	Przyjęte zasady nadzoru całkowicie eliminują możliwość wystąpienia ryzyka. Ryzyko mało realne, małe prawdopodobieństwo, aby mogło wystąpić. Nie odnotowano tego typu zdarzenia w ostatnich pięciu latach.	Ryzyko wystąpienia nie pociąga żadnych niekorzystnych skutków dla interesariuszy wewnętrznych i zewnętrznych, otoczenia lub uczelni.

liczba rodzajów ryzyka	określenie ryzyka	Pw czy odnotowano zjawisko tego typu w skali kraju? czy istnieją i jak funkcjonują mechanizmy i narzędzia kontroli oraz nadzoru?	Ps jakie są skutki dla zainteresowanych (m.in. zdrowotne, wpływ na wizerunek uczelni)?
2	Średnie	Przyjęte zasady nadzoru nie eliminują całkowicie możliwości wystąpienia ryzyka. Ryzyko prawdopodobne. Incydentalnie się zdarzyło w ciągu ostatnich pięciu lat.	Ryzyko wystąpienia nie pociąga żadnych bezpośrednich skutków dla społeczności akademickiej, otoczenia, uczelni, natomiast skutki, które mogą wystąpić, nie mają istotnego znaczenia z punktu widzenia wszystkich zainteresowanych stron.
3	Wysokie	Przyjęte zasady nadzoru umiarkowanie eliminują możliwość wystąpienia ryzyka. Ryzyko bardzo realne i może wystąpić. Odnotowano takie zdarzenie w ostatnich pięciu latach.	Ryzyko wystąpienia może mieć zauważalne niekorzystne skutki dla społeczności akademickiej, otoczenia lub uczelni, w tym skutki zdrowotne, w kontekście możliwości zakażenia; utrata wizerunku uczelni wysoce prawdopodobna.
4	Bardzo wysokie	Przyjęte zasady nie eliminują możliwości wystąpienia ryzyka. Ryzyko jest prawie pewne. Odnotowano takie zdarzenia na uczelni kilkakrotnie w ciągu ostatnich pięciu lat.	Ryzyko wystąpienia będzie miało bardzo poważne skutki dla społeczności akademickiej, otoczenia i uczelni, w tym skutki zdrowotne w dużej skali.

Źródło: opracowanie własne

Przy obliczaniu ryzyka uwzględnia się istniejące mechanizmy i kryteria monitorowania oraz nadzoru analizowanych procesów i ich elementów. Na podstawie analizy ryzyka ustalony zostanie akceptowany poziom ryzyka oraz rodzaj możliwych reakcji na ryzyko (tolerowanie, przeniesienie, wycofanie się, działanie). Określono działania w celu zmniejszenia danego ryzyka do akceptowanego poziomu.

W celu zmniejszenia ryzyka do akceptowanego poziomu określono działania, które mają temu służyć, w kontekście działalności uczelni, zarówno pod kątem prowadzonej działalności dydaktycznej, jak i działalności administracyjnej, w tym działalności projektowej. Działania te mogą być udokumentowane poprzez prowadzenie karty analizy ryzyka.

Tabela 3. Przedziały oceny ryzyka

Przedziały oceny ryzyka	Ryzyko	Reakcja na ryzyko	Monitoring ryzyka	Notatka z monitorowania ryzyka
1-2	nie-znaczne	tolerowanie	ciągły	tylko w sytuacji wystąpienia okoliczności, które zmieniają dotychczasowy poziom ryzyka
3-5	małe	tolerowanie	ciągły	tylko w sytuacji wystąpienia okoliczności, które zmieniają dotychczasowy poziom ryzyka
6-11	średnie	działanie	ciągły	minimum raz na zjazd oraz w sytuacji wystąpienia okoliczności, które zmienią dotychczasowy poziom ryzyka
12-16	wysokie	działanie	ciągły	ryzyko niedopuszczalne, wymagana eliminacja u źródła, wprowadzenie zmian korygujących i zmniejszających ryzyko do poziomu akceptowalnego

Źródło: https://www.portaloswiatowy.pl/kontrola-zarzadcza-w-szkole/karta-analizy-ryzyka-w-ramach-kontroli-zarzadczej-w-szkole-12009.html, dostęp 27.05.2020.

Ogólna ocena ryzyka rozpowszechniania się COVID-19 wśród pracowników oraz studentów w siedzibie PSW wykazała, że po zastosowaniu środków zapobiegawczych możliwa jest realizacja zajęć dydaktycznych/egzaminów, ponieważ ryzyko jest małe i jest ono dopuszczalne. Wymagany jest jednak ciągły monitoring ryzyka.

Reakcją na zaistniałe ryzyko może być jego tolerancja, przeniesienie, wycofanie się lub działanie. Konsekwencją wyniku analizy konkretnego ryzyka jest przewidywanie działań z nim związanych. Można wyróżnić następujące możliwe rodzaje reakcji na zaistniałe ryzyko:

1. Tolerowanie - przyglądanie się zjawisku, w przypadku gdy jego poziom lub zakres jest uznany za bezpieczny (inaczej mówiąc: akceptowalny). Przykładem może być możliwy spadek frekwencji studentów na zajęciach spowodowany sytuacją epidemiczną. Wprowadza się zatem stały/obligatoryjny obowiązek analizowania sytuacji epidemicznej i związanej z nim absencji studentów na obowiązkowych zajęciach dydaktycznych/praktycznych i praktykach zawodowych. Jeśli sytuacja się poprawi, to absencja się zmniejszy. Inaczej natomiast sprawa wyglądać będzie w przypadku absencji spowodowanej ponownym gwałtownym wzrostem zachorowań – wówczas wymaga się podjęcia kroków prewencyjnych.

Tabela 4. Analiza ryzyka rozpowszechniania się COVID-19 wśród pracowników oraz studentów PSW w siedzibie uczelni

Wykaz zagrożeń związanych z rozpowszechnianiem się COVID-19 wraz z podaniem źródeł zagrożeń i ich skutków.				Oszacowanie ryzyka związanego z poszczególnymi zagrożeniami rozpowszechniania się COVID-19			Sposoby zmniejszenia ryzyka rozpowszechniania się COVID-19 oraz powtórne oszacowanie ryzyka po zastosowaniu działań naprawczych			
Lp.	Zagrożenia możliwe do zaistnienia, niebezpieczne wydarzenia	Źródło zagrożeń, przyczyny	Możliwe skutki zagrożeń	Współczynnik skutków (Ps)	Współczynnik wystąpienia (Pw)	Ryzyko (R)	Sposoby zmniejszenia ryzyka rozpowszechniania się COVID-19	Skutek (Ps)	Wystąpienie (Pw)	Ryzyko (R)
1.	Zakażenie osób zdrowych wirusem COVID-19 na terenie uczelni	Niekontrolowane wejście do siedziby uczelni osób zakażonych	Rozpowszechnianie się COVID-19 wśród pracowników uczelni oraz studentów	4 Bardzo wysokie	3 Wysokie	12 Wysokie	Stosowanie procedury wejścia do budynku uczelni (m.in. wypełnienie ankiet, mierzenie temperatury ciała)	4	1	4 Małe
2	jw.	Nieodpowiednia do warunków zagrożenia epidemiologicznego organizacja procesu edukacyjnego	jw.	4	3	12	Organizacja procesu edukacyjnego w sposób ograniczający zajęcia w budynku uczelni, w tym: realizacja zajęć/egzaminów za pośrednictwem platformy zdalnego nauczania, opracowanie wykazu/planu zajęć oraz egzaminów przeprowadzanych na terenie uczelni ograniczonego do niezbędnego minimum, organizacja zajęć/egzaminów z ograniczonym jednoczesnym udziałem studentów	4	1	4
3.	jw.	Nieodpowiednia do warunków zagrożenia epidemiologicznego organizacja procesu obsługi interesantów w poszczególnych działach uczelni	jw.	4	2	8 Średnie	Reorganizacja pracy wszystkich komórek organizacyjnych czelni w sposób zapewniający bezpieczną obsługę interesantów, w tym organizacja pracy w weekendy, wydłużenie czasu pracy poszczególnych komórek poprzez szczegółowe ułożenie harmonogramów pracy, wprowadzenie dyżurów władz uczelni, wprowadzenie harmonogramów obsługi interesantów	4	1	4

4.	jw.	Brak stosowania środków ochrony zbiorowej	jw.	4	3	12	Wyposażenie poszczególnych komórek organizacyjnych uczelni (w szczególności tych mających bardzo częsty kontakt z interesantami) w odpowiednie środki ochrony zbiorowej, w tym ekrany ochronne, stosowanie rozwiązań organizacyjnych, np. przerwy na wietrzenie pomieszczeń, dezynfekcja, ozonowanie	4	1	4
5.	jw.	Brak stosowania środków ochrony indywidualnej, w tym masek ochronnych/ przyłbic, rękawiczek ochronnych	jw.	4	3	12	Zobowiązanie osób przebywających w budynku uczelni do stosowania środków ochrony indywidualnej (maski/ przyłbice, rękawiczki), wyposażenie wszystkich działów oraz umieszczenie na każdej kondygnacji środków dezynfekujących, a także zalecenie stosowania tych środków	4	1	4
6.	jw.	Wystąpienie objawów wskazujących na ryzyko zakażenia w czasie trwania zajęć/egzaminów u osoby, która wcześniej otrzymała ocenę pozytywną na wejściu do uczelni	jw.	4	2	8	Natychmiastowa izolacja osoby potencjalnie zarażonej w pomieszczeniu do tego celu wyznaczonym (sala 16), konsultacja w PIS (Powiatowej Inspekcji Sanitarnej) w Kwidzynie na temat symptomów oraz dostosowanie się do zaleceń Inspekcji Sanitarnej. W razie konieczności przeprowadzenie testów na obecność COVID-19 u osób przebywających w kontakcie, wstrzymanie się od kontynuacji zajęć na terenie uczelni, przeprowadzenie czynności dezynfekujących.	4	1	4

Źródło: opracowanie własne

2. Przeniesienie ryzyka wiąże się z ubezpieczeniem uczelni, ale polega również na przesunięciu zadania do innej jednostki, mniej narażonej na wystąpienie danego ryzyka. Jest to nic innego jak zlecenie pewnych określonych działań (zadań) innemu, zewnętrznemu podmiotowi, dotyczących zajęć dydaktycznych.

3. Wycofanie się to jedno ze skrajnych działań, ale lepiej je podjąć w sytuacji ewidentnego niepowodzenia podejmowanego zadania niż dalej brnąć w zaparte. Dla przykładu: jeśli organizacja zajęć dydaktycznych na uczelni oznaczać będzie realizację zajęć przy frekwencji poniżej 30% i/lub zanotuje się wydarzenie niepożądane – obecność osoby chorej na zajęciach – wówczas jedynym rozsądnym wyjściem jest wycofanie się z przywrócenia realizacji zajęć dydaktycznych/zajęć praktycznych/praktyk zawodowych niż np. ich kontynuacja, która grozić może uczelni dużo poważniejszymi konsekwencjami.

Dla sprawnego funkcjonowania systemu kontroli ważne jest, aby systematycznie monitorować grupy ryzyka. Monitorowanie od czerwca br. jest procesem ciągłym realizowanym w celu ustalenia, czy:

- wystąpiły nowe nierozpoznane rodzaje ryzyka,
- nastąpiły zmiany w poziomie poszczególnych rodzajów ryzyka,
- działania służące zmniejszeniu ryzyka są skuteczne i czy realizuje się te działania.

Zaproponowane mechanizmy kontroli stanowią odpowiedź na konkretne ryzyko, które PSW zamierza wyeliminować/ograniczyć poprzez:

- dokumentowanie systemu tej kontroli,
- dokumentowanie, rejestrowanie i zatwierdzanie (autoryzację) działalności dydaktycznej,
- podział kluczowych nowych obowiązków, powstałych na skutek konieczności funkcjonowania uczelni w czasie zagrożenia epidemicznego,
- weryfikowanie wszelkich działań dydaktycznych/administracyjnych/projektowych przed realizacją i po niej,
- nadzór w ramach hierarchii służbowej,
- rejestrowanie odstępstw od procedur, instrukcji lub wytycznych,
- utrzymanie ciągłości działalności w zgodzie z procedurami bezpieczeństwa i wytycznymi rządowymi/Ministerstwa Nauki i Szkolnictwa Wyższego/Ministerstwa Zdrowia/Głównego Inspektora Sanitarnego,
- kontrolowany dostęp studentów/kadry dydaktycznej do pomocy dydaktycznych zasobów,
- podział obowiązków umożliwiający wykrywanie i korygowanie błędów,
- zapewnienie ciągłości działania obsługi sprzątającej i dezynfekującej,

- zaniechania wykonywania takich zabiegów na salach ćwiczeń w PSW przez studentów, przy wykonywaniu których istnieje możliwość dostania lub przeniesienia zakażenia czy choroby zakaźnej na inne osoby,
- pracownicy uczelni oddelegowani do poszczególnych zadań zobowiązani są do przekazywania swoim przełożonym zauważonych nieprawidłowości czy niepokojących informacji na terenie uczelni, które mogą mieć wpływ na bezpieczeństwo i ochronę zdrowia,
- monitorowanie na bieżąco sytuacji i sporządzanie raportów po każdym zakończonym dniu.

Monitorowanie możliwości zakażenia związanych z przywróceniem stacjonarnych zajęć dydaktycznych na uczelni/realizacją zajęć praktycznych i praktyk zawodowych w jednostkach systemu ochrony zdrowia przez studentów studiów licencjackich i studiów magisterskich na wszystkich prowadzonych kierunkach studiów wiąże się z koniecznością bieżącego, systematycznego zbierania danych, ich analizą, interpretacją i przekazywaniem informacji zwrotnej o wynikach monitorowania wszystkim osobom zainteresowanym, w celu zaplanowania i wdrożenia właściwych praktyk dla funkcjonowania uczelni podczas epidemii COVID-19, a także podczas stanu zagrożenia epidemicznego (po 15.05.2022 r.).

Tabela 5. Cele monitorowania sytuacji epidemicznej w PSW

Cel	Opis
Kontrola wejścia do siedziby uczelni osób potencjalnie chorych	Najważniejszym celem monitorowania jest wygenerowanie danych mogących ukierunkować procedury bezpieczeństwa w PSW na najbardziej efektywne i potrzebne działania.
Przekonanie społeczności akademickiej PSW do stosowania procedur	Umiejętne przedstawienie wyników monitorowania potencjalnych zakażeń, w tym w kontekście stanu epidemicznego w Polsce/Europie może efektywnie wpływać na zmianę zachowania członków społeczności akademickiej i zwiększenie akceptacji procedur bezpieczeństwa niż przytaczanie tekstów naukowych/publikacji.
Ocena skuteczności podjętych działań prewencyjnych	Dotyczy sytuacji, w których stwierdzona zostanie duża liczba osób z podwyższoną temperaturą przy wejściu do siedziby uczelni; konieczne będzie wdrożenie dodatkowych działań/zaprzestanie realizacji zajęć dydaktycznych w formie tradycyjnej; lub sytuacja odwrotna, jednakże ze względu na niepewność efektu konieczna staje się ewaluacja efektów podjętych działań na drodze dalszego monitorowania.

Cel	Opis
Porównanie z innymi uczelniami	Porównanie wyników monitorowania może pozytywnie wpływać na funkcjonowanie uczelni w kontekście zmniejszania ryzyka występowania zakażeń, jednakże pod warunkiem, że dotyczyć będzie porównywalnie prowadzonych procedur bezpieczeństwa oraz porównywalnie realizowanego monitoringu w społeczności akademickiej.
Podjęcie działań w kierunku informacyjno-bibliotecznym (karty obiegowe, prace semestralne i inne) w celu zminimalizowania ryzyka SARS-CoV-2	Wdrożenie działań do monitorowania obsługi członków społeczności uczelni oraz interesantów odbywać się powinno w wyznaczonym Punkcie Informacyjnym z zachowaniem reżimu sanitarnego, ze szczególnym uwzględnieniem zasłaniania nosa i ust.
Nadzór monitorujący prawidłowość zachowań studentów	Zajęcia w pracowniach wymagających posiadania medycznej odzieży i obuwia zmiennego; studenci przebierają się w wyznaczonym miejscu, niedopuszczalne jest przyjście w ubraniu i obuwiu medycznym z zewnątrz.
Nadzór monitorujący prawidłowość zachowań studentów w zakresie bezpieczeństwa epidemicznego.	Wykładowca odpowiada za to, by uczestnicy zajęć ograniczyli do niezbędnego minimum poruszanie się po sali, a jeśli to konieczne, powinni zachować wytyczne sanitarne, a podczas przerw przestrzegać zasad bezpieczeństwa.

Źródło: opracowanie własne

Czynne monitorowanie prowadzone jest przez zespół monitorujący sytuację epidemiczną w PSW – kontrolę sanitarną i stanu dezynfekcji pomieszczeń i sprzętu, wyrywkowe kontrole przestrzegania wdrożonych procedur bezpieczeństwa. Bierne monitorowanie opiera się na zgłaszaniu przypadków zdarzeń niepożądanych przez punkt informacyjny/dziekanat/rektorat/ kwesturę/kancelarię. Monitorowanie polega na kontroli wszystkich możliwości zakażeń w całej siedzibie PSW, rozpoznaniu skali występowania możliwości zaistnienia zdarzeń niepożądanych i wyznaczeniu obszarów wymagających wdrożenia szczegółowego monitorowania celowanego. Monitorowanie potencjalnej chorobowości jest prowadzone jako badanie punktowe (ang. *point prevalence survey*, PPS) w punkcie informacyjnym PSW (hol główny, wejście do budynku), w którym w ciągu każdego zjazdu identyfikowane są potencjalne aktywne zakażenia (na podstawie badania temperatury ciała). Wyniki przedstawiane są jako odsetek stwierdzonych przypadków „podwyższonej temperatury ciała" u studentów/kadry akademickiej i administracyjnej w badanej populacji – społeczności akademickiej PSW obecnej w siedzibie uczelni podczas danego zjazdu. Na podstawie uzyskanych wyników podejmowane były, są i będą wiążące decyzje dotyczące funkcjonowania uczelni w kontekście realizacji zajęć

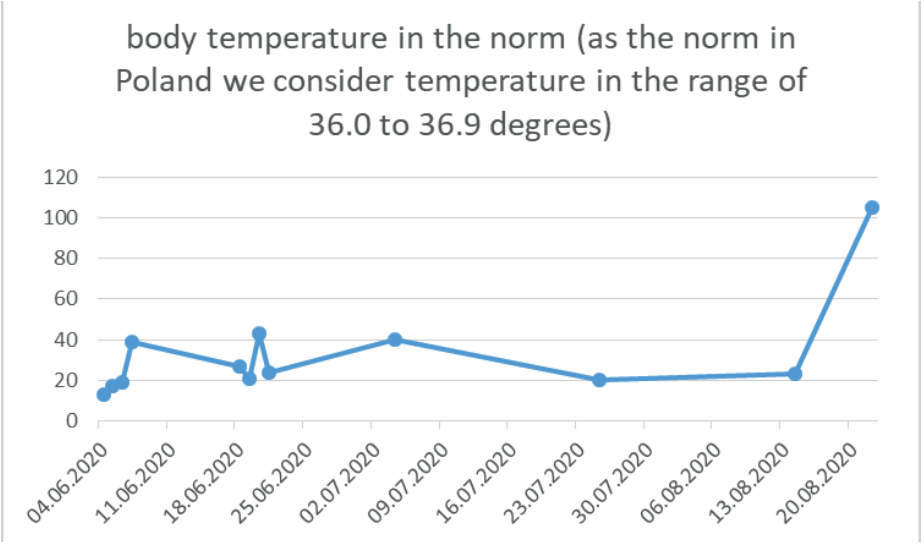
dydaktycznych w formie tradycyjnej. Celem badań jest określanie skali występowania potencjalnych zarażeń, identyfikacja celów i priorytetów dla podejmowania interwencji w kontekście funkcjonowania uczelni, ocena efektów interwencji oraz podnoszenie świadomości i bezpieczeństwa społeczności akademickiej PSW.

Analiza danych odbywa się każdorazowo po okresie zebrania danych (w ujęciu zjazdu), na tyle szybko, aby nie zwlekać z rozpoznaniem problemów i wdrażaniem działań naprawczych i podjęciem kluczowych dla uczelni decyzji. Prezentowane w niniejszym opracowaniu analizy przeprowadzono zgodnie z polityką ryzyka zagrożeń epidemicznych w PSW jako oceny zdarzeń niepożądanych na podstawie pomiarów temperatury studentów i wykładowców/ dydaktyków oraz w oparciu o kwestionariusze ankietowe.

Tabela 6. Karta badań osób wchodzących do siedziby uczelni

Karta badania		
Ciepłota ciała st. C		
36,0–36,9 st. C	Powyżej 36,9 st. C	inne:
liczba osób	liczba osób	liczba osób

Źródło: opracowanie własne



Wykres 1. Liczba osób przebadanych w okresie 4.06.2020-22.08.2020 r. z temperaturą w normie w PSW

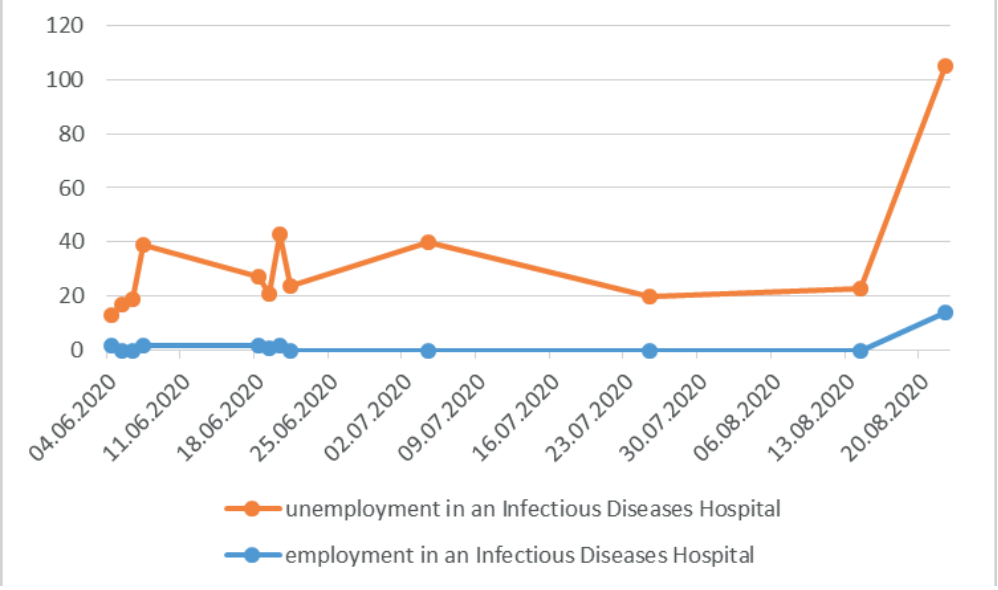
Źródło: opracowanie własne

Weryfikację otrzymanych wyników pomiarów temperatury wzmocniono poprzez zastosowanie kwestionariusza ankietowego. Ocenę możliwości wystąpienia zdarzeń niepożądanych z zakresu zakażeń epidemicznych zrealizowano także na podstawie odpowiedzi badań ankietowych społeczności akademickiej.

Tabela 7. Kwestionariusz ankiety epidemicznej

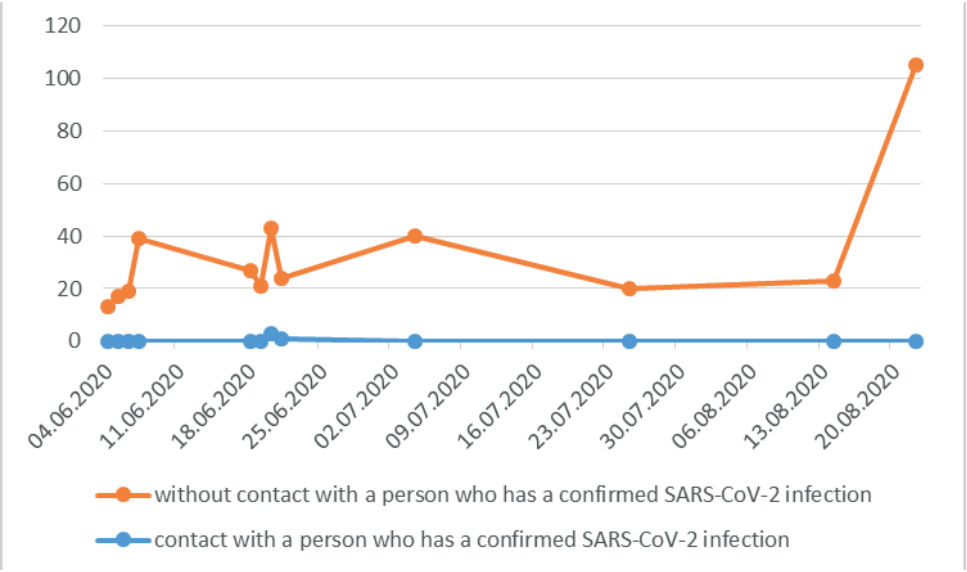
Główna weryfikacja oceny bezpieczeństwa na podstawie ankiety COVID-19		
Wstępna kwalifikacja	**tak**	**nie**
Czy jest Pan/i zatrudniony/a obecnie w szpitalu zakaźnym jednoimiennym?	liczba osób	liczba osób
Czy w okresie ostatnich 14 dni miał(a) Pan(i) kontakt z osobą, u której potwierdzono zakażenie SARS-CoV-2?	liczba osób	liczba osób
Czy miał(a) Pan(i) kontakt z osobą na kwarantannie z powodu zakażenia SARS-CoV-2?	liczba osób	liczba osób

Źródło: opracowanie własne



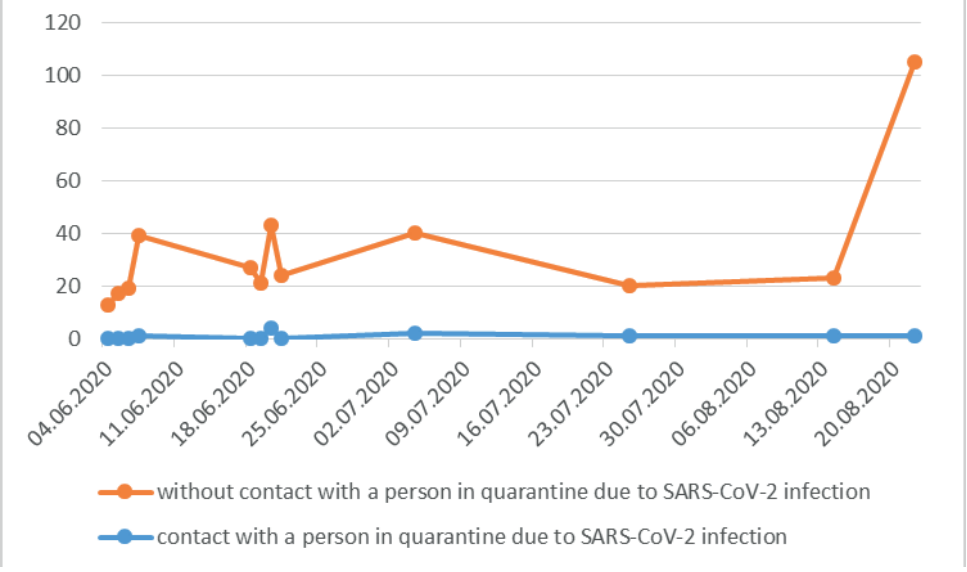
Wykres 2. Liczba osób pracujących / niepracujących w szpitalu jednoimiennym zakaźnym / innym posiadającym chorych covidowych, wchodzących na teren uczelni w okresie 4.06.2020– 22.08.2020 r.

Źródło: opracowanie własne



Wykres 3. Liczba osób z potwierdzonym kontaktem / bez kontaktu z osobą zarażoną koronawirusem, przebadana w okresie 4.06.2020–22.08.2020 r. na terenie uczelni

Źródło: opracowanie własne



Wykres 4. Liczba osób z potwierdzonym kontaktem / bez kontaktu z osobą zarażoną przebywającą na kwarantannie, przebadana w okresie 4.06.2020–22.08.2020 r. na terenie uczelni

Źródło: opracowanie własne

Wykresy wskazują jednoznacznie na fakt realizacji bardzo dokładnego monitoringu potencjalnych sytuacji niepożądanych z obszaru zagrożenia epidemicznego SARS--CoV-2 oraz prowadzonym na uczelni działaniom przeciwdziałającym rozprzestrzenianiu się zakażenia. Osoby z grupy stwarzającej dla pozostałych potencjalną sytuację ryzyka, czyli te, które miały kontakt z osobą chorą lub przebywającą na kwarantannie, zostały zobowiązane do stałego, bieżącego monitoringu ich stanu zdrowia oraz niezwłocznego informowania uczelni o jego zmianach.

Postawiona w niniejszym artykule teza „Implementacja najwyższych procedur bezpieczeństwa w zakresie przeciwdziałania rozprzestrzenianiu się pandemii covid w PSW przyczyniła się w sposób wprost proporcjonalny do braku zdarzeń niepożądanych" została zweryfikowana pozytywnie. Zdecydowanie wprowadzone procedury bezpieczeństwa na najwyższym poziomie w zakresie zapobiegania rozprzestrzeniania się zakażeń oraz stwarzania bezpiecznej przestrzeni dla środowiska akademickiego PSW, przyniosły oczekiwane rezultaty, co potwierdzają zrealizowane badania.

Zakończenie

Bezpieczeństwo osób wchodzących na teren PSW jest kwestią o nadrzędnym znaczeniu dla uczelni**,** która troszczy się o zdrowie i ogólny dobrostan zarówno studentów, jak i wszystkich osób przebywających na terenie uczelni. Na podstawie Zarządzeń i Komunikatów Rektora Powiślańskiej Szkoły Wyższej, w związku z ustawą o szczególnych rozwiązaniach związanych z zapobieganiem, przeciwdziałaniem i zwalczaniem COVID-19, innych chorób zakaźnych oraz wywołanych nimi sytuacji kryzysowych (Dz.U. poz. 374 z 2020 r.), a także komunikatami rządu, zostały wprowadzone na uczelni stosowne procedury oraz działania. Do budynku PSW może wejść wyłącznie osoba zdrowa, bez objawów chorobowych sugerujących chorobę zakaźną. Każda osoba przed wejściem do siedziby uczelni zobowiązana jest wypełnić ankietę epidemiologiczną związaną z COVID-19. Do budynku nie mogą wejść studenci, kadra akademicka i administracyjna oraz inne osoby, które są chore, przebywają w domu z osobą odbywającą kwarantannę lub w izolacji w warunkach domowych, albo same są objęte kwarantanną lub izolacją w warunkach domowych. Do budynku w okresie pandemii mogą wejść wyłącznie osoby z osłoną na usta i nos (maseczka jednorazowa lub wielokrotnego użytku, przyłbica w przypadku osób, które ze względów zdrowotnych nie mogą zakrywać ust i nosa maseczką) oraz w rękawiczkach ochronnych. Zasada zakrywania ust i nosa obowiązuje na terenie całego obiektu. Jeśli z jakiegoś powodu osłona na nos i usta musi zostać zdjęta (konieczność przedłożenia stosownego zaświadczenia

o niemożności noszenia osłony), należy przestrzegać bezwzględnie nakaz 1,5-3-metrowego odstępu od innych osób. W okresie zniesienia wymogów zakrywania ust i nosa na terenie uczelni obowiązują przepisy jak w analogicznych obiektach podległych Ministerstwu Edukacji i Nauki. Każda osoba, która przekroczy wejście główne budynku, zostaje poddana pomiarowi temperatury w Punkcie Informacyjnym PSW, a w pozostałych siedzibach uczelni przy wejściu głównym. Osoba, u której pomiar wskaże temperaturę wyższą niż norma, zostaje odizolowana w wyznaczone miejsce zapewniające minimum 2 metry odległości od innych osób. Według analiz przeprowadzonych na podstawie realizowanego monitoringu epidemicznego stwierdzono, iż w okresie od 4 czerwca do 22 sierpnia 2020 r. u żadnej z osób wchodzących na teren uczelni nie stwierdzono przekroczenia temperatury określanej jako normalna oraz nie wystąpiły żadne niepokojące objawy świadczące o zakażeniu SARS-CoV-2. Zrealizowane badanie stanowi niewątpliwie dowód na poprawnie realizowane procedury bezpieczeństwa na uczelni, a także na to, iż wprowadzony reżim sanitarny spełnia założenia wprowadzonej polityki bezpieczeństwa w okresie zagrożenia epidemicznego. W PSW do 5.05.2022 r. nie odnotowano ani jednego potwierdzonego zakażenia wśród społeczności akademickiej, którego źródłem byłoby niezachowanie reguł bezpieczeństwa na terenie uczelni. Szereg członków społeczności akademickiej, którzy zachorowali na SARS-CoV-2, to osoby z kadry administracyjnej / kadry dydaktycznej oraz społeczności studentów, które w analizowanym okresie, a także do dziś miały kontakt z wirusem poza terenem uczelni – najczęściej w miejscach publicznych. Źródła zachorowań stanowią odrębną analizę.

Literatura

CDC CDC guidance for COVID-19. Evaluating and Testing Persons for Coronavirus Disease 2019 (COVID-19), Revisions on May 3, 2020, https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html.

CHI Health Questions to Ask Yourself About the Coronavirus (COVID-19), CHI Health, 2020, https://www.chihealth.com/en/patients-visitors/coronavirus-covid-19/Coronavirus-questionnaire.html.

Chowdhury R. et al., *Dynamic interventions to control COVID-19 pandemic: a multivariate prediction modelling study comparing 16 worldwide countries*, Springer Link 19 May 2020, https://link.springer.com/article/10.1007/s10654-020-00649-w

ECDC European Centre for Disease Prevention and Control Testing strategies, 2020, https://www.ecdc.europa.eu/en/covid-19/surveillance/testing-strategies.

Green K. et al., *What tests could potentially be used for the screening, diagnosis and monitoring of COVID-19 and what are their advantages and disadvantages?* Centre for Evidence-Based Medicine (EBM), April 20, 2020, https://www.cebm.net/covid-19/what-tests-could-potentially-be-used-for-the-screening-diagnosis-and-monitoring-of-covid-19-and-what-are-their-advantages-and-disadvantages/.

Report 12 – The global impact of COVID-19 and strategies for mitigation and suppression, WHO Collaborating Centre for Infectious Disease Modelling; MRC Centre for Global Infectious Disease Analysis; Abdul Latif.

US Baseline COVID-19 testing program, 2020 Verily Life Sciences LLC https://www.projectbaseline.com/study/covid-19/.

WHO COVID-19 strategy update. Strategic document. Critical preparedness, readiness and response, 14 April 2020, https://www.who.int/docs/default-source/coronaviruse/covid-strategy-update-14april2020.pdf?sfvrsn=29da3ba0_19&download=true.

Streszczenie

Pandemia COVID-19 i okres zagrożenia epidemicznego (wprowadzony po 15.05.2022 r.), skutkujące koniecznością realizacji zajęć w formie tradycyjnej na wybranych kierunkach studiów (np. studiach medycznych i Nauk o Zdrowiu); spowodowała zasadność wdrożenia różnych polityk zarządzania ryzykiem, polityk i procedur w zakresie bezpieczeństwa, a także realizację badań i analiz dotyczących stanu zdrowia i potencjalnego zagrożenia zachorowaniem wśród studentów, kadry dydaktycznej i administracyjnej uczelni na całym świecie. Wdrożone polityki i procedury stosowane w roku akademickim 2019/2020 i kontynuowane w kolejnych latach, mają na celu nie tylko stworzenie warunków do bezpiecznego studiowania, ale również służą przeciwdziałaniu rozprzestrzeniania się pandemii. Celem niniejszego artykułu jest ukazanie analiz statystycznych zrealizowanych na podstawie badań populacji środowiska akademickiego Powiślańskiej Szkoły Wyższej w okresie czerwiec-sierpień 2020 r. oraz przedstawienie wniosków i rekomendacji. Najważniejszym rezultatem wprowadzonego na uczelni reżimu sanitarnego jest brak, potwierdzony badaniami przesiewowymi, przypadków niepożądanych wśród społeczności akademickiej.

Słowa kluczowe: bezpieczeństwo, pandemia COVID-19, stan zagrożenia epidemicznego, procedury bezpieczeństwa, reżim sanitarny

Marek Woś[1]

Refleksyjność ucznia w wychowaniu aksjonormatywnym i w budowaniu jego podmiotowości w celu zapewnienia mu dobrostanu

1. Wprowadzenie

Wychowanie jest procesem, w trakcie którego podmiot wychowujący powinien kierować się powszechnie uznanym dobrem, by podmiot wychowywany osiągnął własną tożsamość (Bocheński 1995, s. 54). Wychowaniu towarzyszy nadzieja nadająca indywidualny sens działaniom wychowawcy, który prowadzi wychowanka do zaproponowanego celu wychowawczego. W związku z tym, iż cel wychowawczy odnosi się do jakiejś bliżej nieokreślonej przyszłości, wychowawca nie jest w stanie przewidzieć jego finalnego zaistnienia. Jest to spowodowane m.in. tym, że wychowanie jest przede wszystkim samowychowaniem podmiotu, który nie ulega bezwarunkowo wpływom wychowawczym, a jego tożsamość zależy od wielu czynników, w większości niezależnych od wychowawcy. Jednakże można przewidzieć, że podmiot osiągnie jakąś tożsamość, ponieważ takową posiada.

Wychowawca nie może być zatem do końca pewien, czy stawiane przez niego cele zostaną w pełni lub częściowo osiągnięte w przyszłości w kontekście dynamicznie zmieniającego się świata. Nie jest on w stanie *zmusić* przyszłości, aby ujawniła ona perspektywę rozwojową wychowanka. Pomimo tego jednak żywi on nadzieję, że zakładany przez niego cel zostanie zrealizowany, bowiem wychowanie pozbawione nadziei byłoby

1 Akademia Nauk Stosowanych Towarzystwa Wiedzy Powszechnej w Szczecinie

absurdalne. W wychowaniu więc chodzi głównie o takie działania, które zmierzałyby do wspomagania wychowanka w jego procesie rozwoju, który prowadziłby go do osiągnięcia pożądanego przez niego dobrostanu (de Tchorzewski 2014, s. 18-19). Ten zaś oznacza takie zaspokojenia – zadowolenie jednostki – z osiągnięcia potrzeb materialnych i niematerialnych wychowanka, które spełniłyby jego zamierzone standardy lub też realizację wyznaczonych wartości: społecznych, duchowych, biologicznych, psychologicznych, ekonomicznych, kulturalnych oraz ekologicznych (*Jakość życia*... 2008, s. 42). Takie spostrzeżenie zgodne jest z myślą Zygmunta Baumana, który uważa, że „(…) nasz świat jest najbardziej złożonym systemem, jaki sobie potrafimy wyobrazić, jego przyszłość jest wielką niewiadomą i pozostanie nią bez względu na to, co zrobimy" (Bauman 2011, s. 173).

Obecna epoka naznaczona jest głównie ideą wolności, czyli wywodzi się z aksjologii liberalnej, choć obecne są wciąż pewne elementy idei chrześcijańskich. Przybiera ona postać tzw. nowego humanizmu, kreującego wizję jednostki i społeczeństwa. Choć może to się wydawać paradoksalne, ale wydaje się, że istnieje korespondencja między aksjologią chrześcijańską a liberalną i to na wielu płaszczyznach. Natomiast różnica między nimi ujawni się w sposób zasadniczy natychmiast po postawieniu pytania o granice pomiędzy tymi dwoma systemami aksjologicznymi. Warto wspomnieć, iż uniwersalne wartości wywodzą się z praw natury i są zgodne z prawem stanowionym. Istnieją one niezależnie od człowieka i jego świadomości oraz kształtują człowieka jako osobę w sferze bycia i posiadania, a także pełnią poznawcze funkcje motywujące, modelujące i wspierające. Oprócz tego stwarzają one warunki do realizacji podmiotowości i podkreślają jej miejsce w otaczającej rzeczywistości.

2. Podmiotowość wychowanka

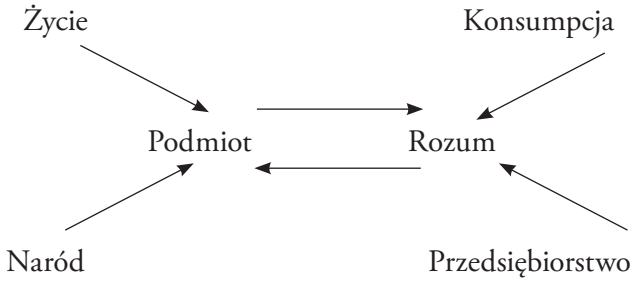
Pod koniec XX wieku pojawiła się nowa koncepcja zmiany społeczno-historycznej, czyli teoria podmiotowości i generacji społecznej, która do tej pory budziła kontrowersje w kręgach nauk społecznych. Wraz z jej uprawianiem zaczęto kłaść nacisk na mechanizmy napędzające zmiany, zwracając uwagę na indywidualne i zbiorowe działania, które tworzą społeczne światy. Zwrócono uwagę na otwartość, selektywność i wielokierunkowość możliwych procesów. Dlatego też wiele osób rozumie ją jako cechę i stan życia, w kontekście istnienia życia indywidualnego, które rozumie sens jako dobre życie, jednakże nie do końca rozumiane. Wybór, który jest stanem świadomego praktykowania osobistej dobrej woli, za którą kryje się twórcza istota, jest więc trudny. To wszystko przyczynia się do dalszego impulsu rozwojowego osoby, poszerzając jej podmiotowość.

Należy podkreślić, iż podmiotowość jest perspektywą poznawczą, godzeniem się na różne stanowiska, rozumieniem własnego istnienia jako *bycia-w* i *bycia-ku*. W takim rozumieniu podmiotowości można przyjąć, iż istnieje ona w wymiarze indywidualnym w osobie, z tożsamością i wolną wolą, nie jest trwała, ale budowana jest poprzez etapy formacji, by osiągnąć samodzielność i umiejętność bezpośredniego podejmowania decyzji w realizacji pojawiających się i przewidywanych celów. W procesie formacji wychowawca skupia się w kształtowaniu podmiotowości na realizacji wartości, które zaproponował lub wybrał, choć nie można wykluczyć, że niektórych z nich wychowanek nie zechce realizować jako postawionych przed nim celów. Jest to spowodowane tym, iż jednostka działa jako podmiot, zastanawiając się nad sobą, w różnych kontekstach, powodując zarazem zmiany w świecie społecznym i naturalnym. Wpływa także na istniejącą rzeczywistość nie tylko poprzez treść i formę, ale również dzięki relacjom społecznym zakorzenionym w interakcji.

Wywołane przez wychowanka zmiany są zwykle celowe, ponieważ ich intencjonalna intensywność prowadzi do określonego efektu. Na marginesie warto podkreślić, że indywidualna podmiotowość w odgrywaniu wielorakich ról społecznych może przejawiać się w różny sposób. Mając to wszystko na uwadze, można powiedzieć, że w wychowaniu mamy do czynienia z podmiotowością społeczną, ponieważ dziecko w tym procesie jako podmiot w relacjach społecznych powinno mieć świadomość tego, kim jest, czym się staje lub do czego nie dąży. Ma to zatem realny wpływ na jego bycie i na to, co bezpośrednio dzieje się w jego szeroko rozumianym środowisku wychowawczym. Wydaje się, że taki pogląd ma wystarczające uzasadnienie, skoro zdaniem niektórych autorów dopuszczalne jest łączenie podmiotowości nie tylko z indywidualnymi wyborami, ale także z alternatywnymi możliwościami działania. Jest to zakorzenione w tożsamości wychowanka, w jego byciu sobą, dającym mu poczucie sprawczości, poczucie przynależności do swoich działań i poczucie przynależności do siebie, które jest nieustannie budowane w autorefleksji. Podmiotowość ucznia polega na tym, że jako człowiek dochodzi on do zrozumienia sprawczości w otaczającym go świecie, ponieważ jest świadomy swojej odrębności i podmiotowości. Jego zachowanie wynika z posiadanej sprawczości, czyli z przekonania o niezależnym wpływie manifestacji lub jej braku, tj. pewnych działań zewnętrznych oraz z poczucia odpowiedzialności wynikającej z relacji człowieka z innymi w ramach danej struktury społecznej. Chodzi głównie o dokonywane przez niego wybory: realizowane zadania, pełnione funkcje, stosowane metody pracy i wybieranie partnerów do pracy czy zabawy, a przede wszystkim dotyczy to jego wolności, przewidywanych lub nieprzewidzianych decyzji, za które czuje się odpowiedzialny[2].

2 Więcej na temat podmiotowości w: Woś 2022, s. 123-143.

Na marginesie można wspomnieć, iż rolę podmiotu w społeczeństwach nowoczesnych podjął Alain Touraine, który scharakteryzował to pojęcie jako wolę jednostki do działania i bycia uznaną za tę, która odpowiada za swoje poczynania. W swoich przemyśleniach stwierdził on również, że upodmiotowienie to nic innego jak transformacja jednostki w podmiot, przeniknięcie jednostki przez podmiot. Ponadto zaproponował on możliwość rozpoznania w tradycji religijnej odniesienia do podmiotu, czego zsekularyzowana kultura nie powinna odrzucać, gdyż niektóre elementy przyjęte wraz z sekularyzacją społeczeństwa wywodzą się z dziedzictwa Kościołów oraz ugruntowanych religii. Jego zdaniem nowoczesność łączy rozum i podmiot, który można zobrazować w następujący sposób:



Schemat 1. Obraz nowej nowoczesności

Źródło: Touraine 2006, s. 779.

Autor zaproponował także odejście, za przykładem Paula-Michela Foucaulta, od dotychczasowej interpretacji społeczeństwa i przyjęcie jego końca jako samokontrolującego się systemu, ponieważ jednostka tworzy samą siebie, stanowiąc zarazem jedyną zasadę osądu moralnego.

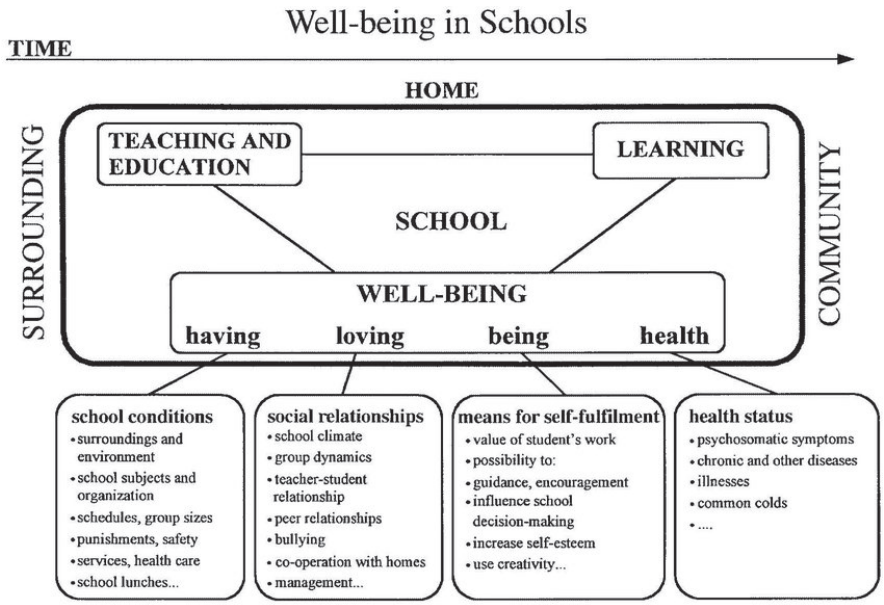
3. Dochodzenie przez wychowanka do dobrostanu

Janusz Czapiński zarysował oryginalną teorię dobrostanu jako cebulowej teorii szczęścia, w której uwypuklił trzy pojęcia: **cebula dobrostanu** – mechanizm psychologiczny mający za zadanie wyjaśnić zależności pomiędzy subiektywnym poczuciem szczęścia a zewnętrznymi okolicznościami oraz cechami osobowości określonej osoby; **teoria cebulowa** – kryzysy życiowe człowieka, z których jednostka może otrząsnąć się, gdyż jej poziom zadowolenia z życia osadzony jest na pozytywnym nastawieniu do świata i ludzi; **homeostaza szczęścia** – stan równowagi, do której jednostka powraca

po najtrudniejszych życiowych doświadczeniach, ponieważ zasadniczą rolę odgrywa w tym elemencie wola życia, gwarantująca na różnych etapach życiowych stałe poczucie szczęścia.

Zarysowana przez Czapińskiego koncepcja jest o tyle interesująca, że zakłada się w niej stały poziom szczęścia każdej jednostki, nieulegający większym wahaniom przez znaczną część jej życia. Inaczej ujmując, na osobę przeżywającą na danym etapie swojego rozwoju jakiekolwiek niepowodzenie wpływa ono na jej dobrostan subiektywny, jednakże w tym samym momencie jej wola życia niejako automatycznie zostaje pobudzona do wyrównania deficytu szczęścia. W ten sposób po pewnym czasie jednostka odzyskuje stopień zadowolenia z życia (Czapiński 2017).

Przywołując pojęcie dobrostanu w odniesieniu do ucznia, uprawnione wydaje się odwołanie do opracowania naukowców fińskich, którzy na podstawie badań wyróżnili cztery główne aspekty składające się na szkolny dobrostan:



Rys. 1. Model dobrostanu szkolnego

Źródło: Konu, Rimpelä, 2002.

Zgodnie z rysunkiem 1 na dobrostan ucznia budowany w szkole, który jest rozłożony w czasie, składają się: dom, otoczenie i społeczność. Szkoła bowiem nie tylko naucza wychowanka, ale również sprzyja uczeniu się przez niego. Na dobro-

stan szkolny składają się również warunki w szkole (mieć), stosunki międzyludzkie (kochać), środki do samorealizacji (istnienie) oraz stan zdrowia (zdrowie). Taki punkt widzenia zgodny jest z interpretacją zjawisk społecznych Margaret Archer, która uważa, że społeczeństwo nie posiada samoświadomości w odróżnieniu od każdej jednostki, która jest w pełni świadoma swojego istnienia, poprzez refleksyjność (Archer 2012, s. 201).

Odwołując się do trzeciego elementu, który wydaje się, że jest zasadniczy w budowaniu dobrostanu ucznia, należy pamiętać, iż w filozofii przyjmuje się, że znamy istnienie jako realne, wówczas kiedy coś można uznać za rzeczywiste, ponieważ istnieje jako podmiot. Wolno zatem powiedzieć, że nawiązanie kontaktu z realnym bytem jest pierwszą rzeczą, która daje jednostce poczucie związania z podstawami realizmu. Dopiero na podstawie takiego kontaktu jednostki z realnie istniejącym światem, tj. realnym istnieniem jako tłem owego spotkania, może ona poznać jego treść i naturę, jak również zaznajomić się z treścią poznania uzyskanego z rzeczywistości realnego istnienia danego bytu. W oparciu o te przesłanki można stwierdzić, iż tylko ludzki umysł może zrozumieć rzeczywistość, istniejącą samą w sobie, ponieważ jest on zdolny do tego, aby postrzegać wszystko, co istnieje, jako *rzeczywistość*, *byt*, *dobro*. Oznacza to, że każdy przedmiot istniejący w rzeczywistości jest prawdziwy, istniejący i dobry. A zatem świat realny pojawia się przed ludzkim rozumem jako świat natury behawioralnej – podmiot ludzkiego poznania, a sam człowiek jako istota ludzka, działająca świadomie i dobrowolnie.

Samo poznanie świata, który naprawdę istnieje, choć jest warunkiem koniecznym działania, nie jest założeniem wystarczającym, gdyż poznanie mówi jednostce, jaki jest świat. Jednakże, aby działać, musi ona odpowiednio podporządkować swojej reakcji istniejący i znany jej świat, tj. widzieć w nim motyw swojego postępowania. Wynika to z faktu, że jeśli ona nie działa, a potem zaczyna działać, to jest jakiś powód, dla którego działa częściej niż nie działa. Jest więc coś, co wyrywa ją z biernej postawy wobec rzeczy i ludzi, których widzi. To właśnie ów motyw wyzwala człowieka z bierności, powodując jego działanie, które nazywamy dobrem, prowadzącym go do wyzwolenia w nim poczucia dobrostanu. Tak więc różne rzeczy i okoliczności pobudzają reakcję wychowanka, zwłaszcza na samym początku rozpoznawania rzeczywistości. Dlatego też jeśli wizje różnych bytów inspirują go do działania, to wyrażają się one w podjętych przez niego sformułowaniach rzeczywistych sądów: *czyń to teraz, tutaj, tak a tak*; *nie czyń teraz*. Takich sądów może być wiele, gdyż doświadcza on w sobie szeregu praktycznych osądów. Aby jednak podjął się on konkretnego działania, powinien najpierw określić je, wybierając spośród wielu jeden aktualny sąd jako konkretną możliwość jawiących się przed nim różnych działań.

W takich przypadkach jednostka zwykle nie zwraca uwagi na kolejność rzeczywistych osądów, ponieważ ludzie często nie są w pełni świadomi faktu, że należy wybrać osąd, aby wykorzystać go do określenia ostatecznego działania. Naturalnie nawyki, przyzwyczajenia i nieuchronne wizje często prowadzą ich do automatycznej selekcji. Jednakże wolno stwierdzić w oparciu o doświadczenie, że w obliczu rzeczywistego działania istnieje realny wybór – spontaniczny lub refleksyjny, jak się wydaje, wymuszony refleksją – w którym ludzie sami, zgodnie z własną wolą, wybierają praktyczną ocenę dobra. Wówczas ów osąd – w wyniku dobrowolnego wyboru – determinuje ich rzeczywiste działanie. Dlatego też prawdziwym wyborem, w rzeczywistej ocenie znanego dobra, jest akt decyzyjny człowieka.

Z poczynionych uwag można zatem wywnioskować, że wychowankowie mają autonomię w ustalaniu dla siebie reguł postępowania. Nikt nie może ich zmusić, by chcieli czegoś, czego nie chcą w swoim sprawstwie. Moment podjęcia decyzji jest więc głównym punktem odniesienia dla rozumienia obowiązywania prawa jako takiego. Kwestie zgodności z ogólnym, szkolnym i społecznym porządkiem prawnym są podobne. Treść ogólnych norm prawnych po ich ogłoszeniu do wiadomości (lub też po zapoznaniu się z nimi przez ucznia) skutkuje ze strony nauczyciela egzekwowaniem norm od ucznia. A zatem wychowanek powinien znać treść porządku prawnego, osobiście ustosunkować się do jego treści, a następnie ją zaakceptować, aby skorzystać z obowiązującego prawa. Może także odmówić podporządkowania się temu prawu, jeśli uzna je za sprzeczne z jego wrodzonym przeświadczeniem w dobro ogólne. Tak więc moment osobistej decyzji, w której człowiek ustanawia dla siebie kodeks postępowania, zasadniczo wyjaśnia ludzką funkcję prawa.

Aby zrozumieć naturalne prawa racjonalnej natury człowieka, szczególnie ważne jest uświadomienie sobie, dlaczego jednostka sama wybiera tak konkretny praktyczny osąd w zachowaniu decyzyjnym, determinując tym jej działania w prawdziwym życiu. Interpretacja tego faktu, jak się wydaje, ma na celu zwrócenie uwagi na naturę bytu indywidualnego jako bytu otwartego. Aby działać, musi on zdecydować się na samo działanie i niejako zamknąć swoją otwartość. Wyzwala wówczas działanie, ponieważ jest zmotywowany do niego przez bycie postrzeganym jako dobry, gdyż dobroć jest motywacją jednostki do działania, a nie do zaniechania działania. Konkretne postrzeganie dobra przez wychowanka jest powodem, dla którego wybiera on ten rzeczywisty osąd dobra nad innymi osądami, wówczas również wola i emocje są skierowane ku dobru. Dobro jest przedmiotem jego pożądania, aktem woli, prowadząc wychowanka do osiągnięcia dobrostanu (Hołyst 2013, s. 103-105).

4. Refleksyjność człowieka w odniesieniu do aksjologii

W bogatej literaturze końca XX wieku podkreśla się, że żyjemy w czasach wielkich przemian. Zmiany kulturowe zachodzące we współczesnym świecie znajdują odzwierciedlenie głównie w hierarchii wartości i wychowaniu młodszego pokolenia. Fala zmian, transformacji i rozwoju porwała ze sobą wiele osób, które często nie wiedzą, dokąd zmierzają, próbując resztkami sił utrzymać się na powierzchni życia. Nigdy wcześniej o kryzysie nie mówiono tak często i tak głośno. Najbardziej tragicznymi jego konsekwencjami są trudności gospodarcze i społeczno-polityczne, którym towarzyszy kryzys osobisty – kryzys ludzki. W codziennym życiu można doświadczyć, że przezwyciężanie problemów finansowych niekoniecznie musi iść w parze z przezwyciężaniem osobistych kryzysów. Dlatego też żadna ogólnoeuropejska organizacja czy sojusz nie są w stanie zagwarantować poszanowania godności i podmiotowości człowieka, kiedy ludzie zapominają o właściwej koncepcji osoby i jej tożsamości.

Nie powinno więc dziwić, że pojawiają się pytania o człowieka i jego formację aksjologiczną. Współczesny kontekst wychowawczy młodego pokolenia wydaje się wręcz niezwykły. Ścierają się w nim kultury i różne – często przeciwstawne – aksjologie i paradygmaty widoczne w kulturze i filozofii postmodernistycznej prezentowane w imię niezrozumianego dobra, propagujące poglądy nie tylko przeciwstawne, np. do Kościoła, ale także do prawa natury. W związku z tym coraz bardziej zauważalne są kryzysy człowieka: sumienia i prawdy, życia i śmierci, wolności i odpowiedzialności.

Doświadczenie człowieka jako bytu rozumnego, świadomego, niepowtarzalnego, indywidualnego znane jest od starożytności, choć człowiek jako byt nie był wówczas dokładnie zdefiniowany. Za tłumaczenie tego pojęcia przyjęto określenie Boecjusza (Cichosz 2007, s. 60-63): „persona est naturae rationalis individua substantia”[3].

Odwołując się zatem do przedstawionej definicji osoby, należy zwrócić uwagę na rozumność, ponieważ istota ludzka, posiadając liczne właściwości, jako kluczową posiada refleksyjność, która jest przyczynowa, co oznacza, że jest ona zdolna do świadomego, twórczego, swobodnego sprawstwa, a jednocześnie brania odpowiedzialności za różnego rodzaju działania na rzecz osiągnięcia wyznaczonych celów, zgodnie z określeniem własnych potrzeb i wartości. Sprawstwo człowieka jest bowiem niewątpliwie związane z uwarunkowaniami aksjologicznymi. Człowiek jako istota przyczynowa rozwija się i doskonali twórczo, ale także swoim działaniem przyczynia się do rozwoju kultury i cywilizacji. Jest to wyraźnie sprzeczne z tendencją deterministyczną, zgodnie z którą człowiek jest wypadkową wpływów środowiska. Tak więc człowiek

3 Boetius, *Liber de persona et duabus naturis et una persona Christi*, w: PL LXIV, col. 1343 D.

z jednej strony łatwo ulega wpływom świata zewnętrznego, ale jednocześnie poprzez działania twórcze przyczynia się do zmian w świecie. Dlatego też np. w koncepcji Margaret Archer człowiek najpierw rozumie swoją naturę, następnie określa swój system wartości, później zaś na ich podstawie określa cele (Archer 1995).

Z kolei dla Krzysztofa Wieleckiego istotą człowieka jest człowieczeństwo, które definiuje on przede wszystkim jako podmiotowość, która jego zdaniem jest niezrozumiała poza subiektywnym (podmiotowym) systemem wartości (Wielecki 2003, s. 305). Najczęstszym kluczem do zrozumienia wartości i stosunku ludzi do nich samych jest zaproponowana przez M.S. Archer koncepcja *racjonalności instrumentalnej*. Według niej bowiem ważne są ludzka troska i emocje, gdyż postrzega ona osobowość jako fundamentalne ucieleśnienie ludzkiego wymiaru, który wiąże się z poczuciem własnej wartości. Tym bowiem, co odróżnia nas od przedmiotów, jest nasza zdolność odczuwania, doświadczania i reagowania na sytuacje wynikające z naszego stosunku do reszty świata. To właśnie ta *fundamentalna troska* sprawia, według niej, że *jesteśmy* (działamy) w sensie moralnym. Tym samym kwestie etyczne odgrywają znaczącą rolę w procesie wychowania.

Wartości i normy są tworzone, interpretowane, oceniane i przekazywane na poziomie systemu społeczno-kulturowego. Jednak niektóre z nich czasami same stają się wartościami automatycznymi. Wydaje się więc, że istnieją one równolegle, w pewnym sensie niezależnie od kontekstu społeczno-kulturowego, niejako od niego wyabstrahowane, aby być przetwarzane jako treści trzeciego świata. Wśród światów kultury i ich wartości, które nigdy nie zostały w pełni zrozumiane, istnieją te, które ściśle związane są z podstawowym zbiorem problemów. Ontologiczna refleksja nad człowiekiem i światem prowadzi nas do kategorii wartości obiektywnych, tzn. takich, które człowiekowi przypisane są w określony sposób. W pewnym sensie jesteśmy do nich *powołani*.

Aby istnieć i w miarę prawidłowo funkcjonować oraz zachować zdolność do rozwijania tożsamości i osobowości, wychowanek powinien mieć fundamentalne przekonanie, że rozumie świat, w którym żyje, i odnajduje w nim swoje miejsce. To nie tylko kwestia ciekawości czy warunek skutecznego działania, ale podstawowa potrzeba przetrwania. Wychowanek w trakcie procesu wychowawczego uczy się podejmowania działań mających na celu zrozumienie świata, które zmuszają go do refleksji. Dzięki temu poprzez różne praktyki zaczyna rozumieć i wyjaśniać obiektywnie istniejący porządek świata. W ich wyniku wyróżnia porządki: ontologiczny, moralny i poznawczy. W wyniku praktyki rozumienia, interpretowania i doświadczania gromadzi mniej lub bardziej świadomy, spójny, kompletny i realistyczny zestaw przekonań związanych z teoretycznymi kategoriami porządku świata. Idea porządku świata, którą tworzy, jej manifestacja, jest jego przestrzenią intelektualną, mentalną mapą topograficzną, która orientuje jego życie w czasie i przestrzeni (Wielecki 2022, s. 22-24).

5. Propozycja modelu aksjonormatywnego wychowania zawartego w systemie wychowawczym szkoły

Na początku edukacji jednostki są niejako zmuszone do przeżywania wartości, ale po ich internalizacji przyjmują je jako własne. Dlatego tak ważne jest uświadamianie ich uczniom w procesie formacyjnym, aby mogli przeżywać i odnosić wartości do własnych zainteresowań.

W kontekście rozważanego tematu chciałbym zaproponować opisany przeze mnie (Woś 2022) model aksjonormatywny, który jest konstrukcją opierającą się na rzeczywistym świecie wartości, w którym każdy z podmiotów różnie usytuowanych w relacji wychowawczej (uczeń, nauczyciel i rodzic) oddziałuje wzajemnie na siebie. Bierze on pod uwagę sferę aksjologiczną, która w jego konstrukcji ma podstawowe znaczenie dla systemu wychowania w aspekcie kształcenia, prowadząc wychowanka do umiejętności odkrywania wartości w kulturze. Dzięki niej wychowanek poznaje wartości, a w hierarchii rozróżnia ich rodzaje. W odniesieniu do odkrywania wartości w kulturze podczas realizowania programu wychowawczego wychowanek nabywa umiejętności odkrywania ich, nazywania i rozróżniania. Dlatego też dzięki wejściu w zaproponowaną sferę aksjologiczną, która najczęściej jest spójna z rodzinną, dochodzi do kształtowania jego osobowości, postaw i zachowań według wcześniej zaproponowanego modelu. Wszystko w tym celu, aby to, co nabędzie w okresie formacji, mógł później realizować w życiu dorosłym, dążąc do samorozwoju i dzięki temu osiągając dobrostan.

Model aksjonormatywny stanowi pomost między oczekiwaniami instytucji edukacyjnych a oczekiwaniami środowiska domowego wobec uczniów. Pomaga wzmocnić program edukacyjny szkoły we wszechstronnym rozwoju ucznia, poprzez ukazanie mu wartości, które przyswoił, w zaplanowanym i przemyślanym programie edukacyjnym. Jego wykorzystanie w pracy edukacyjnej może wskazać wychowawcom stopień rozwoju edukacyjnego lub brak postępów wychowanków w zakresie wychowania. Diagnozuje on płaszczyzny i problemy wychowawcze. Odzwierciedla podwójną podmiotowość w relacji pomiędzy nauczycielami a uczniami, opartą na wzajemności i dwukierunkowości w procesie interakcji. Sprzyja ze strony wychowanka rozpoznaniu przez niego wartości (celów), rozumienia ich oraz zaakceptowania i urzeczywistnienia w jego działaniu.

Proponując wykorzystanie modelu aksjonormatywnego, warto zwrócić uwagę, że w programie wychowawczym nie chodzi o to, aby uczeń zasymilował wszystkie wartości, ale by zaszczepić w nim działania o charakterze wychowawczym, dzięki którym będzie mógł osiągnąć kolejne umiejętności, wsparte jego refleksją, która

powinna doprowadzić go do przeświadczenia, iż może w oparciu o własne siły dojść do kolejnych celów, osiągając dzięki temu dobrostan. Propozycja modelu, by zastosować go w procesie wychowawczym, związana jest z tym, iż w procesie wychowawczym nie należy zakładać, że czynności wychowanka z zasady nakierowane są na wartości, ponieważ w tym aspekcie nic w jego życiu nie dzieje się mimowolnie. Pomimo tego, że ma styczność z wartościami w domu, jak i w innych grupach, do których przynależy, to jednak przez całe życie zapoznaje się z nimi. Najpierw zostają przedstawione mu przez dorosłych, później sam je odkrywa. W początkowej fazie dotarcie do nich naznaczone jest jego decyzją, a później częstokroć dodatkowo jeszcze wyrzeczeniami i pracą. Zatem aby wartości urzeczywistnione zostały w życiu wychowanka, powinny być mu ukazane i to najlepiej w pewnej hierarchii, by uwypuklić ich znaczenie w jego życiu, jak i społeczeństwa. W ten sposób poprzez poznanie ich, a następnie refleksję i konkretne działanie zobrazowane za pomocą metody, uczeń, widząc określony cel swoich dążeń, jest w stanie zbliżyć się do niego lub go osiągnąć. Tym samym potrzebne są ze strony wychowawcy określone działania w celu weryfikacji poczynań ucznia, ponieważ wychowanie domaga się zwerbalizowanych celów zamieszczonych w programie wychowawczym, które ukazane są w aspekcie jednostkowym, jak i wspólnotowym. Jednostkowym, gdyż wpływają bezpośrednio na wychowanka oraz wspólnotowym, ponieważ jego działania osadzone są we wspólnocie i na nią odziałują, częstokroć w interakcji z innymi.

Świadome i celowe działania wychowawcze nakierowane na wychowanka ukazują perspektywę jego rozwoju, wskazując na cele zdobyte przez niego oraz te, które powinien osiągnąć. Ów proces w trakcie edukacji poddawany jest systematycznej ewaluacji, w zależności od zaprogramowania przez wychowawcę, który dzięki rozeznaniu aktualnej sytuacji wychowanka umie dostrzec nie tylko jego obecne działania, ale także tę postawę, którą przyjmie prawdopodobnie w przyszłości. Dzięki temu wychowawca jest w stanie odpowiednio pobudzić rozwój wychowanka, w oczekiwanym przez niego i siebie kierunku. Poprzez realizację takiej czynności proces wychowawczy zdaje się być uporządkowany. Tak więc dzięki umieszczonym w programie celom wychowawca wskazuje wychowankowi drogę za pomocą metod i środków wychowawczych. Ma to wymiar typowo pragmatyczny, ponieważ chroni zarówno wychowawcę, jak i wychowanka od chaosu w postępowaniu, dążąc do ideału wychowawczego. Zmierza w kierunku wszechstronnego, integralnego rozwoju osobowości młodego człowieka. Dzięki celowemu ukierunkowaniu działań w jego życiu następuje zmiana w aktywności dochodzenia przez niego do celów, tzn. z mniejszego do większego (Woś 2022, s. 271-273).

6. Zakończenie

Proces wychowania dzieci przez rodziców to szereg czynności wykonywanych indywidualnie lub zbiorowo. Powodują one pewnego rodzaju przemiany w indywidualnej osobowości dziecka. Kolejność działań jest odpowiednio dostosowana do oczekiwanych zamierzeń.

Przyszłość społeczeństwa zależy także od wpływu, jaki pedagodzy mają w trakcie formacji na powierzonych ich opiece wychowanków. Z tego powodu wychowawca powinien starać się oddziaływać na ucznia w taki sposób, aby nauczył się on dokonywać samodzielnych wyborów, które odpowiadają i będą oczekiwane przez niego, jak i społeczeństwo. Taka postawa wynika z odpowiedzialnego wychowania jednostek, z podmiotowego ich traktowania. Skupia się ona przede wszystkim na pomocy w dynamicznym rozwoju młodych ludzi, którzy powinni dojrzewać do przekonań uczenia się przez całe życie. W zdaniu tym zawarte są ważne wartości, którymi kieruje się wychowawca podczas procesu wychowania, czyli kształtowania zdolności uczniów do dokonywania przez niego samodzielnych wyborów dzięki wychowaniu zorientowanemu na jego podmiotowe traktowanie. Ważnym elementem takiego procesu jest właściwie dobrany przez wychowawcę zestaw wymagań, w których zaproponuje on uczniowi działania prowadzące do osiągnięcia mniej lub bardziej konkretnych celów. W tym przypadku możliwości wychowawcy w zakresie transformacji istniejącego systemu są nieograniczone i obejmują wywoływanie konfliktów wychowawczych, aby zniechęcić ucznia do nieodpowiedniego sprawstwa, a promując jego rozwój we właściwym kierunku, by osiągnął on zamierzony cel. Jednakże bez współpracy ucznia, czyli bez jego refleksyjnych działań, żaden proces edukacyjny nie może się odbyć, a przede wszystkim nie może osiągnąć oczekiwanych skutków. W związku z tym w kształtowaniu pozytywnych postaw ucznia i eliminowaniu negatywnych zachowań wiele zależy od wychowawców. Dlatego też cele edukacyjne powinny być jasno określone, a nie uogólniane, ponieważ indywidualne traktowanie wychowanka opiera się na przesłankach moralnych i uznaniu jego dobra.

Podmiotowość w wymiarze osobistym ulokowana jest w osobie, z poczuciem tożsamości i jej wolnej woli oraz w decyzjach ukierunkowanych na realizację celów. Przeważnie skupiają się one na jego rozwoju, w oparciu o urzeczywistnienie wartości, które wychowawca zaproponował lub wybrał, choć nie można wykluczyć, że niektórzy wychowankowie nie będą chcieli realizować postawionych przed nimi celów w trakcie procesu wychowawczego.

Uczeń działa jako podmiot, zastanawiając się nad sobą w różnych kontekstach, powodując zmiany w świecie społecznym i naturalnym. Wpływa na istniejącą rzeczywistość nie tylko poprzez treść i formę, ale także poprzez relacje społeczne zako-

rzenione w interakcji. Wywołane przez niego zmiany są zazwyczaj celowe, ponieważ ich intencjonalna intensywność prowadzi do określonego efektu. Jego podmiotowość w pełnieniu różnych ról społecznych może przejawiać się w różny sposób. Można zatem powiedzieć, że w wychowaniu mamy do czynienia z podmiotowością społeczną, ponieważ w wychowaniu dziecko, jako podmiot w relacjach społecznych, powinno być świadome tego, kim jest, czym staje się lub czego nie stara się robić, gdyż jego sprawstwo ma realny wpływ na jego bycie i na to, co dzieje się bezpośrednio w jego szeroko rozumianym środowisku edukacyjnym. Tak więc podmiotowość ucznia polega na tym, że w trakcie procesu wychowawczego dochodzi on do zrozumienia świata, w miarę jak uświadamia sobie swoją odrębność i podmiotowość. Tym samym jego działania wynikają z posiadanej przez niego sprawczości oraz z przekonania i poczucia odpowiedzialności za wpływ wykonanych lub niewykonanych czynności.

Rodzice zazwyczaj są dla swojego dziecka autorytetem zbudowanym na dialogu, kompetencjach, wartościach i przyjaźni. Są dla niego wzorem do naśladowania i punktem odniesienia, gdy ono dorasta i dojrzewa. W działaniach edukacyjnych nauczyciela ważna jest zatem umiejętność interpretacji zmieniającej się rzeczywistości po to, by dziecko mogło odkrywać własną wartość i prawdę o sobie. W związku z tym obowiązkiem wychowawcy jest prowadzenie uczniów, posługując się dialogiem czerpiącym podstawy z ogólnie uznanych i przekazywanych wartości, które uważa on za ważne. Owa edukacja aksjologiczna prowadzi ucznia do zrozumienia jego osobistego stosunku do wartości poznanych i doświadczanych, zadaniem wychowawcy jest zaś pokazać, jak powinien do nich dążyć i jak je realizować. Dobroć serca i życzliwość wychowawcy kształtują w owym procesie postawę oczekiwania, pożądanej ze strony ucznia, gdyż przekłada się to na postawę – względem wychowawcy i innych – pełną szacunku, przyjaźni i zaangażowania.

Dobieranie właściwych zasad do kierowania działaniami rodzicielskimi i wychowawczymi oraz wzięcie odpowiedzialności za właściwą ich organizację, a także ich przebieg to niebagatelne zadanie spoczywające na osobach odpowiedzialnych za wychowanie młodego pokolenia. Przyjęte bowiem przez nich normy przyczyniają się do realizacji celów i treści edukacyjnych, pośród których można wyróżnić: świadomy i aktywny udział uczniów w rodzicielstwie, koordynację wielorakich wpływów rodzicielskich, więzi i członkostwo w grupach rodzicielskich, trwałość i operatywność nabytych umiejętności oraz doktrynę humanizmu i interakcji.

Niewątpliwie szkoła to miejsce, w którym budowana jest podmiotowość wychowanka. Proponowany model może być narzędziem w pracy pedagogów, m.in. w zakomunikowaniu uczniowi osiągniętych celów oraz wskazaniu mu niezrealizowanych elementów w jego rozwoju osobistym, w procesie dążenia do pełnego człowieczeństwa.

Bibliografia

Archer M.S., 1995, *Realist Social Theory: The Morphogenetic Approach*, Cambridge.

Archer M.S., 2013, *Człowieczeństwo. Problem sprawstwa*, tłum. A. Dziuban, Kraków.

Bauman Z., 2011, *44 listy ze świata płynnej nowoczesności*, Kraków.

Bocheński J., 1995, *Dzieła zebrane*, t. 5, *Etyka*, Kraków.

Boetius, *Liber de persona et duabus naturis et una persona Christi*, w: PL LXIV, col. 1343 D.

Cichosz W., 2007, *Formacyjna rola szkoły katolickiej, XV-lecie „Gdyńskiego Katolika" 1992-2007*, Gdynia.

Czapiński J., 2017, *Psychologia szczęścia. Kto, kiedy, dlaczego kocha i co z tego wynika, czyli nowa odsłona teorii cebulowej*, Warszawa.

Hołyst B., 2013, *Zagrożenia ładu społecznego*, t. 1, Warszawa.

Jakość życia, *Socjologia. Przewodnik encyklopedyczny*, 2008, Warszawa 2008.

Konu A., Rimpela¨ M., 2002, *Well-being in schools: a conceptual model*, „Health Promotion International" nr 17, https://pdfs.semanticscholar.org/f395/67c0b94ceedbd6dc0ec683ba5f31639770ac.pdf (dostęp: 3.05.2023).

Tchorzewski A.M., 2014, *O potrzebie i pożytkach nadziei w wychowaniu*, w: *Nadzieja i sprawiedliwość jako sprawności moralne w wychowaniu*, red. I. Jazukiewicz, E. Rojewska, Szczecin.

Touraine A., 2006, *Rola podmiotu w społeczeństwach nowoczesnych*, przeł. M. Frybes, w: *Współczesne teorie socjologiczne*, wybór i opr. A. Jasińska-Kania, L.M. Nijakowski, J. Szacki, M. Ziółkowski, Warszawa.

Wielecki K., 2003, *Podmiotowość w dobie kryzysu postindustrializmu. Między indywidualizmem a kolektywizmem*, Warszawa.

Wielecki K., 2022, *Podmiotowość i sprawczość – z perspektywy realizmu krytycznego*, „Edukacja Humanistyczna", nr 47/2.

Woś M., 2022, *Aksjonormatywne wymiary wychowania do podmiotowości społecznej. Studium koncepcji wychowania Towarzystwa Salezjańskiego*, Warszawa.

Streszczenie

Struktury społeczne są z natury dwojakie, po części są produktem subiektywnych działań, które kształtują nie tylko osoby, ale także wynikają z interakcji między nimi. W rzeczywistości społecznej istnieje zarówno obiektywna faktyczność, jak i subiektywne znaczenie, to znaczy struktura i subiektywna inicjatywa, chociaż obie mogą istnieć oddzielnie. Jednostki zawsze znajdują się w strukturalnym polu sił, więc nie mogą działać arbitralnie. Ten porządek strukturalny jest tłem dla ich przyszłych działań, opartych na bieżących i wcześniejszych

działaniach prowadzących wychowanka do osiągnięcia dobrostanu. W procesie wychowawczym refleksyjność jest wyłaniającą się właściwością jednostki, odmienną od wyłaniających się właściwości kultury i struktur, która uwarunkowana jest przez te podmioty. Wspomniany przeze mnie model aksjonormatywny może stać się jednym z narzędzi w pracy wychowawcy, który posłuży mu do budowania podmiotowości ucznia w dążeniu przez niego do zrealizowania stawianych przed nim celów.

Słowa kluczowe: wychowanie, podmiotowość, wartości, dobrostan, uczeń

Justyna Szybska-Lewandowska[1]

Paradoks dobrobytu nowoczesnych technologii. Moda czy konieczność? Rozważania na przykładzie województwa pomorskiego

1. Wstęp

Innowacyjność i dążenie do lepszej jakości i komfortu życia, które stanowią synonim dobrobytu, można uznać za kluczowe słowa XXI wieku. Współczesny człowiek ceni sobie nowoczesne technologie, zwłaszcza w kontekście dostępu do wszechobecnego internetu i mediów społecznościowych. Mało jednak kto zastanawia się nad konsekwencjami tak dynamicznego rozwoju innowacji i dostępu do coraz to nowocześniejszych technologii. Celem artykułu jest pokazanie ukierunkowania polityki europejskiej, w tym polskiej, na ciągłą poprawę poziomu innowacyjności i warunków prowadzenia działalności gospodarczej. Aspekt ten zobrazowano na podstawie analizy kilku globalnych, europejskich bądź krajowych rankingów innowacyjności i innych danych statystycznych dotyczących realizowania działalności badawczo-rozwojowej. Istotę dobrobytu nowoczesnych technologii zobrazowano na przykładzie województwa pomorskiego, pokazując rolę i znaczenie w regionie Inteligentnych Specjalizacji Pomorza. Finalnie artykuł zwraca uwagę na paradoks nowoczesnych technologii i konsekwencje tak dynamicznie następujących zmian technologicznych, chociażby w postaci konieczności zdefiniowania tzw. kompetencji przyszłości, ale także pilnej potrzeby edukacji w obszarze władzy algorytmów.

1 Powiślańska Szkoła Wyższa

2. Innowacyjność i dobrobyt – kluczowe słowa XXI wieku

Pojęcie innowacji jest dziś odmieniane przez wszystkie przypadki niemalże w każdej branży i gałęzi ekonomii. Moda na wdrażanie innowacji ogarnęła cały świat – wszyscy chcą wyróżniać się najnowszymi produktami czy usługami. Ale czy na pewno jest to konieczność, czy po prostu nakręcona spirala konkurencyjności wśród podmiotów na rynku? Wszyscy stawiają na innowacje, ale czy rzeczywiście dobrze interpretują to słowo, nie nadużywając go? W końcu w języku codziennym często kojarzymy innowacyjność z pewnego rodzaju rewolucją, która ma znacznie ułatwić nam życie, a przez to poprawić nasze codzienne odczucie dobrobytu. I tak dochodzimy do punktu, w którym to innowacja stanowi wręcz „klucz do drzwi przyszłości", ma rozwiązywać nasze codzienne problemy, poprawiać to, co niedoskonałe, wyręczać nas w pracy, po to, abyśmy mogli lepiej i dłużej cieszyć się życiem. Sama działalność innowacyjna podejmowana przez sektor naukowy i biznesowy stanowi dziś wręcz odzwierciedlenie stanu poszczególnych gospodarek czy danego regionu. Poziom innowacyjności dyktuje tempo i kierunek rozwoju krajów na świecie.

W literaturze przedmiotu trudno znaleźć jednoznaczną definicję innowacji. Wśród przyczyn tego zjawiska można wskazać krótką tradycję prowadzenia badań nad rozumieniem i postrzeganiem tego pojęcia. Definicja ta pojawia się także w znaczeniu szerokim i wąskim. „Szerokie znaczenie dopuszcza już niewielką zmianę jako innowację, bowiem wystarczy, aby było to coś udoskonalonego, nieznacznie zmodyfikowanego. Natomiast w wąskim znaczeniu innowację stanowi zasadnicza zmiana, która służy zrewolucjonizowaniu danej dziedziny. Jest zjawiskiem rzadkim i nieprzewidywalnym, ale może odmieniać życie całej ludzkości" (Żero 2018, s. 36-37). Pewne jest także to, że jesteśmy świadkami poważnych zmian w pojmowaniu procesu powstawania i znaczenia innowacji. „Tradycyjne podejście do innowacji, oparte na wynikach własnego zaplecza badawczo-rozwojowego oraz długotrwałych i kosztownych badaniach chronionych przed konkurencją przestało się sprawdzać. Pojawiła się nowa koncepcja tworzenia innowacji – koncepcja tzw. otwartych innowacji" (Sopińska 2018 s. 22), polegających na wykorzystywaniu przez przedsiębiorstwa takich praktyk, które łączą zastosowanie zewnętrznych i wewnętrznych pomysłów, jak również procesów implementacji innowacji na rynek. Z pewnością daje to dużą nadzieję na budowanie coraz bardziej trwałego nawyku do współpracy na linii biznes – nauka.

„Niekiedy innowacje są z góry zaplanowane, niekiedy są spontaniczne, gdy powstanie przedmiotu bądź procesu nie było wynikiem poszukiwań rozwiązań, na które istniało zapotrzebowanie" (Tutaj 2019, s. 13).

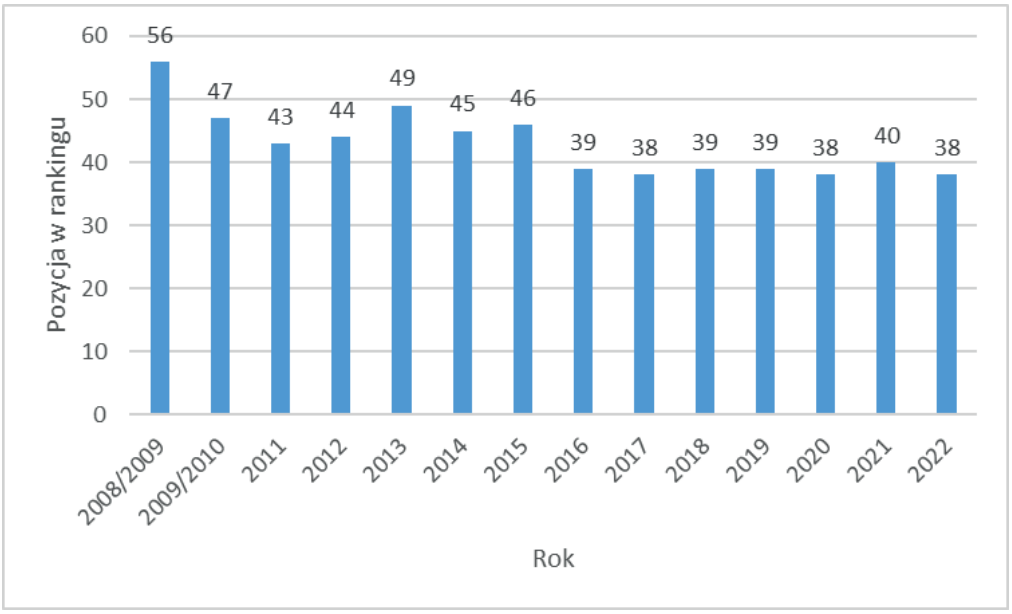
Podobnie jak w przypadku pojęcia innowacji, także próba zdefiniowania dobrobytu nastręcza wiele problemów i wymaga spojrzenia przez pryzmat różnorodnych czynników. Dobrobyt jest przedstawiony jako pojęcie złożone, a jego synonimami w literaturze przedmiotu są takie określenia, jak: „poziom zamożności, poziom życia, jakość życia. Poziom zamożności odnosi się jedynie do wartości materialnych, np. wielkości majątku. Z kolei jakość życia to kategoria analizowana najczęściej ze względu na: szczęście, zasoby, potrzeby" (Wronowska 2015, s. 6). W ujęciu literatury przedmiotu dobrobyt „skupia się na poziomie satysfakcji z warunków gospodarczych, politycznych, kulturowych czy środowiskowych. W tym aspekcie można wyróżnić dwa rodzaje dobrobytu – gospodarczy oraz społeczny – jednak należy pamiętać, że nie istnieje spójna i akceptowalna przez wszystkie dyscypliny nauki definicja dobrobytu" (Bogdański, Strzała 2019, s. 139).

Biorąc pod uwagę poczynione uwagi, krótkie rozważania definicyjne innowacji i dobrobytu, warto spojrzeć na oba zagadnienia jak na parę dobrych przyjaciół. Władze publiczne, które kreują i stymulują politykę rozwoju innowacji, zarówno na szczeblu krajowym, jak i regionalnym, zdają się od dawna mieć świadomość, jak bardzo klimat otoczenia świata nauki i biznesu może wpływać na dobrobyt lokalny lub krajowy, co widać przede wszystkim po konstrukcji wielu strategii rozwoju miast czy danych regionów. W dużym uproszczeniu często spotykamy się ze stwierdzeniem, że innowacje po prostu poprawiają jakość życia, która z kolei uważana jest właśnie za synonim dobrobytu. Fascynujące podkreślenie wzajemnego oddziaływania na siebie obu tych pojęć wskazuje Matt Ridley, brytyjski pisarz popularnonaukowy, biznesmen: „Innowacja jest dzieckiem wolności i rodzicem dobrobytu. (…) Przyszłość jest ekscytująca i to nieprawdopodobne dążenie do innowacji zaprowadzi nas tam" (Kwaśnicki 2021).

3. Mierniki innowacyjności. Gdzie jesteśmy i dlaczego? Aspekt krajowy

Jednym z syntetycznych mierników dostarczających wiedzy na temat innowacyjności gospodarek na całym świecie jest Globalny Indeks Innowacyjności (Gll), który powstaje na podstawie analizy 81 wskaźników, dotyczących m.in. takich kwestii, jak: zgłoszenia patentowe, edukacja, otoczenie biznesu czy zaawansowanie gospodarki w kontekście innowacji. W 2022 r. w rankingu Gll Polska zajęła 38. miejsce wśród analizowanych 132 gospodarek na świecie. Warto podkreślić, że wynik ten stanowi awans o dwie pozycje w porównaniu do miejsca uzyskanego rok wcześniej oraz sta-

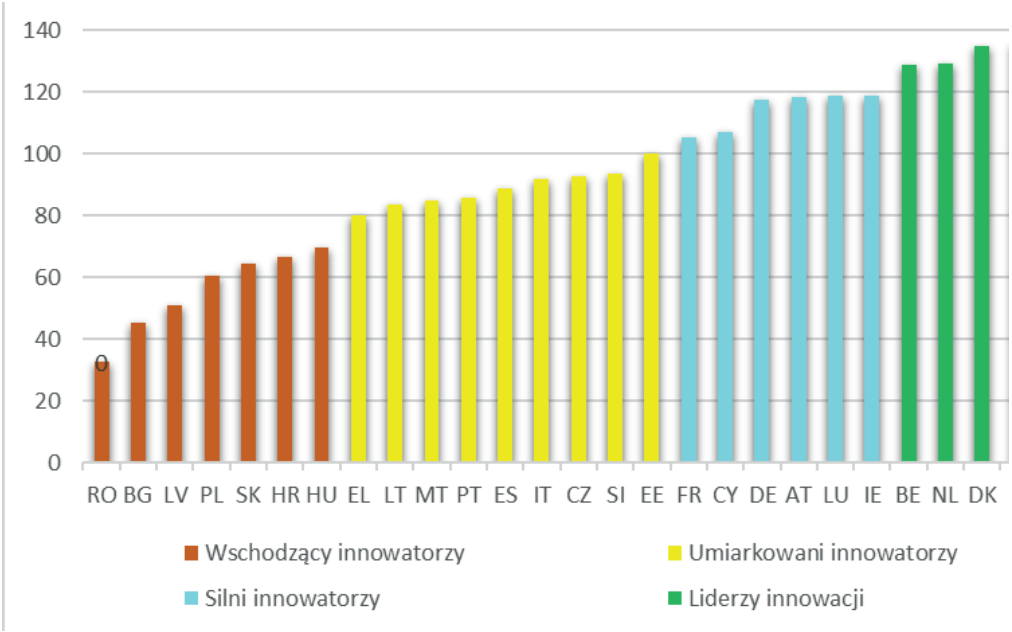
nowi zdecydowaną poprawę w porównaniu z latami 2008-2010, kiedy to nasz kraj zajął w rankingu odpowiednio 56. i 47. miejsce. Pierwszą pozycję zajęła Szwajcaria, niedościgniony lider od lat. Tuż za nią uplasowały się Stany Zjednoczone i Szwecja. Kształtowanie się pozycji Polski w tym rankingu w latach 2008-2022 zobrazowano na rys. 1.



Rysunek 1. Pozycja Polski w rankingu Globalny Indeks Innowacyjności w latach 2008-2022.

Źródło: opracowanie własne na podstawie danych GUS (https://sdg.gov.pl/statistics_nat/9-1-a/, dostęp: 1.05.2023).

Kolejnym badaniem, które pozwala ocenić poziom innowacyjności w państwach członkowskich Unii Europejskiej, jest Europejski Ranking Innowacyjności (EIS), publikowany od 2001 r., klasyfikujący państwa unijne na liderów innowacji, silnych, umiarkowanych bądź wschodzących innowatorów. Zgodnie z wersją raportu EIS z 2022 r. nasz kraj nadal znajduje się w grupie wschodzących innowatorów, czyli najmniej innowacyjnych krajów w UE. Osiągnęliśmy wynik 60,5% średniej unijnej rankingu, co stanowi wzrost o 4,3% w stosunku do 2021 r., a w porównaniu do 2015 r. – wzrost o 11,3%. W grupie wschodzących innowatorów, poza Polską, znalazły się także Bułgaria, Chorwacja, Łotwa, Węgry, Rumunia i Słowacja. Pokazuje to rys. 2.



Rysunek 2. Wyniki państw członkowskich UE w zakresie systemów innowacji

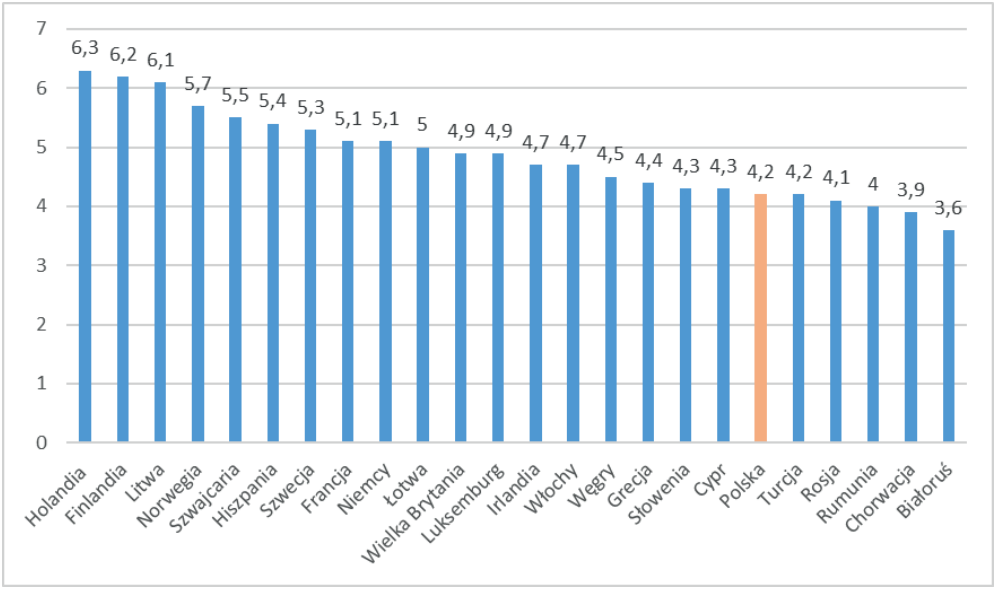
Źródło: opracowanie własne na podstawie European Innovation Scoreboard 2022, European Commission, s. 7

„Poprawa wskaźników cząstkowych EIS 2022 w stosunku do roku poprzedniego nastąpiła w obszarach takich jak: innowacje procesów biznesowych, zatrudnienie w innowacyjnych przedsiębiorstwach oraz obecność zagranicznych doktorantów" (Narodowy… 2022, s. 7). Wciąż mamy jednak wiele do zrobienia. W najbliższych latach kluczowa będzie poprawa w obrębie takich zagadnień, które wskazywane są przez unijnych urzędników jako nasze najsłabsze strony, a są to: technologie środowiskowe, mobilność kadry w jednostkach naukowych i technologicznych oraz nakłady finansowe na innowacje w przeliczeniu na jednego pracownika.

Kolejnym raportem, który pozwala na weryfikację trendów w aspekcie działalności przedsiębiorstw, jest Globalny Monitor Przedsiębiorczości (GEM), dostarczający już od ponad dwóch dekad dane obrazujące różnice „pomiędzy państwami w zakresie przedsiębiorczych postaw, działań i aspiracji oraz pozwalają na wskazanie czynników kształtujących poziom aktywności przedsiębiorczej i jej charakter. W Polsce badania w ramach projektu GEM realizowane są od 2011 r." (Tarnawa (red.) 2022, s. 8). Chociaż raport nie dotyczy stricte działalności innowacyjnej przedsiębiorstw, to należy pamiętać, że inicjatywa tego sektora do kreowania innowacji z pewnością jest kluczowa, a warunki rozwoju firm będą także miały swoje przełożenie na chęć do

inwestowania w ryzykowne projekty badawczo-rozwojowe (B+R). W raporcie GEM publikowany jest tzw. Krajowy Wskaźnik Uwarunkowań Przedsiębiorczości (NECI). Z założenia wskaźnik ten ma pomóc w ocenie poziomu łatwości i możliwości rozwijania działalności gospodarczej w krajach objętych badaniem. Dlatego im lepszy klimat rozwoju przedsiębiorczości w danym kraju, tym lepsze miejsce w rankingu.

W przypadku Polski konieczne jest zaprojektowanie pewnych zmian, które przyczynią się do poprawy warunków prowadzenia własnego biznesu. Jak podaje raport GEM, Polska pod względem wskaźnika NECI zajmuje dopiero 20. miejsce wśród 25 krajów Europy ankietowanych w 2021 r. Najwyższą wartość tego wskaźnika z krajów europejskich odnotowała Holandia, wysoko w rankingu znajdują się też Finlandia, Litwa, Norwegia czy Szwajcaria. Szczegółowe zestawienie wartości wskaźnika NECI zawiera rys. 3.



Rysunek 3. Krajowy Wskaźnik Uwarunkowań Przedsiębiorczości w Polsce i w krajach Europy objętych badaniem NES w 2021 r.

Źródło: opracowanie własne na podstawie Tarnawa (red.) 2022, s. 92.

Przedstawione dane dotyczące działalności innowacyjnej i rozwoju przedsiębiorczości w Polsce na tle innych państw Europy czy świata jasno pokazują, jak wiele jest jeszcze w tym obszarze do zrobienia. Należy mieć jednak świadomość, że w przypadku podejmowanych trudnych działań B+R trzeba je traktować jako proces, który przynosi efekty na przestrzeni kliku lat. Obecnie firmy na całym świecie prowadzą swoją działalność w cza-

sach VUCA, charakteryzujących się niepewnością i koniecznością szybkiego, zwinnego reagowania na zachodzące zmiany. Z pewnością swoje piętno odciska w przypadku niektórych z branż także wygasająca pandemia COVID-19 oraz efekty niepokojów gospodarczych związanych z wciąż trwającym konfliktem zbrojnym w Ukrainie. Pewnego rodzaju „trudność czasów", w których przyszło funkcjonować obecnie przedsiębiorcom, potwierdza Międzynarodowy Barometr Innowacji 2023[2], zawierający informacje m.in. o tym, jak firmy finansują swoje projekty B+R oraz jaki wpływ na podejmowaną działalność innowacyjną ma obecny kryzys energetyczny. Zdaniem 50% specjalistów biorących udział w badaniu inflacja będzie miała negatywny wpływ na wysokość budżetów przeznaczonych na realizację prac B+R. Dodatkowo zdecydowana większość podmiotów (57% ankietowanych) opiera swoją aktywność innowacyjną na własnych zasobach. Aż 72% respondentów ocenia, że wzrost kosztów energii wpływa na rentowność i komercyjny sukces ich biznesu.

Chociaż dane pozycjonujące Polskę na tle innych krajów w aspekcie szeroko rozumianej innowacyjności jasno pokazują, jak wiele jest jeszcze do poprawy, to z kolei najnowsza statystyka w zakresie działalności badawczej i rozwojowej firm w Polsce napawa już większym optymizmem. „W 2021 r. w działalność B+R zaangażowanych było 7370 podmiotów, tj. o 15,5% więcej niż w roku poprzednim. Nakłady krajowe brutto na działalność B+R wyniosły 37,7 mld zł i zwiększyły się w skali roku o 16,3%" (Wegner 2022, s. 15). Analizując poszczególne sektory wykonawcze, należy podkreślić, że „najwyższe nakłady na prace B+R poniósł sektor przedsiębiorstw – wynosiły one 23,8 mld zł, stanowiąc finalnie 63,1% nakładów krajowych brutto na działalność B+R. Ponad jedna trzecia ogólnej wartości nakładów wewnętrznych na prowadzenie projektów B+R przypadła na sektor szkolnictwa wyższego, którego nakłady wyniosły 13,1 mld zł" (Wegner 2022, s. 15). Dodatkowo większość nakładów krajowych brutto na działalność B+R została sfinansowana ze środków wewnętrznych (blisko 52%).

Polskie firmy dążą w kierunku innowacji, co potwierdza także badanie Polskiej Agencji Rozwoju Przedsiębiorczości pod nazwą Monitoring innowacyjności polskich przedsiębiorstw. Raport wskazuje, że 79,6% firm działających w Polsce wprowadziło lub próbowało wdrożyć w 2021 r. przynajmniej jedną innowację, przy czym widać też jasną zależność pomiędzy wielkością firmy a działalnością innowacyjną. „Większe firmy częściej dążą do wprowadzania korzystnych zmian i częściej są w tym zakresie

2 Międzynarodowy Barometr Innowacji (International Innovation Barometer) wydawany jest przez Ayming Polska sp. z o.o. Jak podają autorzy, by opracować Barometr, przeprowadzono szczegółowe badanie wśród 846 starszych specjalistów ds. badań i rozwoju, dyrektorów finansowych, członków wyższej kadry kierowniczej i właścicieli firm w 17 krajach: w Belgii, Chinach, Czechach, we Francji, w Hiszpanii, Holandii, Irlandii, Kanadzie, Niemczech, Polsce, Portugalii, Singapurze, Słowacji, na Węgrzech, w Wielkiej Brytanii, we Włoszech i w Stanach Zjednoczonych.

skuteczne. Jednocześnie duże przedsiębiorstwa przodują we wdrażaniu nowych rozwiązań produktowych, przy czym mikroprzedsiębiorstwa – we wdrażaniu innowacyjnych procesów biznesowych" (parp.gov.pl). Podmioty biorące udział w analizowanym badaniu przyznają, że podejmowane przez nie działania innowacyjne przyczyniły się przede wszystkim do rozwoju firmy, podniesienia jakości jej usług i wyrobów, a także do zwiększenia wydajności pracy, co niewątpliwie można łączyć z dobrobytem rozpatrywanym przez pryzmat funkcjonowania firmy jako jednostki.

Chociaż otwartość polskich firm na podejmowanie działalności innowacyjnej wydaje się wzrastać, to warto zastanowić się nad determinantami hamującymi potencjał firm do rozwoju ich produktów i usług. Wśród głównych barier rozpoczynania działań innowacyjnych respondenci wymieniają bariery administracyjne oraz koszty (odpowiednio 77,9% i 72,2% wskazań). Wśród przeszkód w kierunku działań na rzecz innowacji wymieniano także m.in. trudności w pozyskiwaniu wykwalifikowanych pracowników, brak czasu na myślenie o innowacjach czy też skomplikowanie przepisów prawa w tym obszarze.

Wzrost zainteresowania przedsiębiorstw projektami badawczo-rozwojowymi jest także widoczny w wykorzystaniu tzw. ulgi podatkowej na działalność B+R. Zainteresowanie tym mechanizmem rośnie z roku na rok. „O ile w 2016 r., w początkowym okresie obowiązywania ulgi, skorzystało z niej 571 podatników, to w 2021 r. z ulgi skorzystało już 3606 podatników" (www.gov.pl).

4. Innowacyjne województwo pomorskie

Województwo pomorskie jest postrzegane jako region przyjazny przedsiębiorcom, w którym konsekwentnie od wielu lat buduje się tzw. ekosystem innowacji. Silnym atutem jest zróżnicowana oferta pomorskich uczelni, instytucji otoczenia biznesu (IOB), jednostek badawczych, sieci klastrowych oraz infrastruktury sprzyjającej dla co-workingu i start-upów. Władze regionu podejmują wiele działań sprzyjających budowaniu pozytywnego klimatu rozwoju przedsiębiorczości i innowacji, mimo to pomorski potencjał na tle regionów z krajów Europy Zachodniej nadal jest oceniany jako niski. W rankingu opracowanym przez Komisję Europejską pod nazwą Regional Innovation Scoreboard 2021 Pomorskie jest „wschodzącym innowatorem plus" i zajmuje dopiero 184. pozycję na 240 regionów europejskich objętych badaniem.

Pomorskie wyróżnia się jednak pod względem oceny innowacyjności na tle kraju, zajmując czołowe miejsca w branżowych rankingach. W 2020 r. ponownie zajęło 4. lokatę w rankingu innowacyjności regionów w Polsce, lokując się tuż za wojewódz-

twami: mazowieckim, małopolskim i dolnośląskim, zmniejszając także swój dystans do lidera rankingu. Pomorskie w 2021 r. charakteryzowało się też m.in. największym udziałem finansowania działalności B+R ze środków sektora przedsiębiorstw, obok województwa podkarpackiego. Wysokie są także nakłady wewnętrzne na działalność B+R wynoszące 2891,2 mln zł, co daje 5. lokatę w kraju.

Zauważalny jest duży potencjał województwa w zakresie rozwoju technologii informatycznych, takich jak np. sztuczna inteligencja, rozszerzona i wirtualna rzeczywistość czy systemy autonomiczne. „W Pomorskiem zauważalny jest wzrost zainteresowania zastosowaniem technologii opartej na sztucznej inteligencji, który wywiera coraz mocniejszy wpływ na gospodarkę. Trójmiasto zajmuje 2. po Warszawie miejsce w Polsce pod względem liczby przedsiębiorstw korzystających ze sztucznej inteligencji w swoich produktach i usługach" (Regionalny… 2023, s. 21). Wzmocnienia wymaga jednak oferta usług specjalistycznych, świadczonych przez pomorskie IOB, oraz rozpoznawalność tych instytucji przez same firmy.

5. Inteligentne Specjalizacje Pomorza – nieznana szansa w kierunku dobrobytu

Koncepcja wprowadzenia inteligentnych specjalizacji została zaproponowana już w minionej, finansowej perspektywie unijnej na lata 2014-2020. Upatrywano w nich szansę na rozwój innowacji w całej UE oraz przyspieszenie wzrostu w słabiej rozwiniętych krajach unijnych. Poprzez uzyskanie priorytetowego dostępu do dofinansowania polityka UE jasno wskazywała, że „kraje czy regiony powinny rozwijać programy inwestowania w takie obszary gospodarki, które cechują się relatywnymi przewagami konkurencyjnymi i uzupełniają endogeniczne zasoby regionów, przyczyniając się w dalszym etapie do tworzenia przyszłych możliwości krajowych zasobów produkcyjnych oraz międzyregionalnych przewag komparatywnych" (Radło, Napiórkowski, Szczech-Pietkiewicz 2020, s. 130-131). W naszym kraju koncepcja inteligentnych specjalizacji realizowana jest na dwóch poziomach – centralnym i regionalnym.

Po kilku latach ich funkcjonowania można już pokusić się o pierwsze oceny wpływu inteligentnych specjalizacji na pobudzanie lokalnej czy centralnej innowacyjności. Czy rzeczywiście koncentracja wiedzy i zasobów na ograniczonej liczbie priorytetów gospodarczych przyniosła swój efekt i zbudowało to przewagę konkurencyjną? Czy firmy z obszarów inteligentnych specjalizacji mogą rozwijać się bardziej efektywnie? Przykład województwa pomorskiego, w dużym uogólnieniu, pokazuje, że koncepcja jest słuszna. Wymaga jednak pewnych weryfikacji, a przede wszystkim zmian mentalnych (zwłaszcza wśród sektora biznesu i nauki), które nie zachodzą tak łatwo ani szybko.

Zgodnie z zaleceniami polityki unijnej Inteligentne Specjalizacje Pomorza (ISP) zostały zdefiniowane w wyniku tzw. procesu przedsiębiorczego odkrywania. W praktyce oznacza to, że ISP zostały wybrane w formule dialogu i partnerstwa w ramach ogłoszonego Konkursu na wybór Inteligentnych Specjalizacji Pomorza. Spośród zgłoszonych propozycji władze regionalne wybrały te o największym potencjale rozwojowym, czyli tzw. specjalizację morską, ICT, energetyczną i zdrowotną[3]. Szczegółowe zakresy przedmiotowe każdej ze specjalizacji określają Porozumienia na rzecz ISP. Warto podkreślić, że proces przedsiębiorczego odkrywania zastosowany przy wyłanianiu inteligentnych specjalizacji na Pomorzu zyskał uznanie wśród przedstawicieli UE, a region był stawiany za wzór w tym aspekcie dla innych lokalnych samorządów w Polsce.

Zrealizowana na zlecenie Urzędu Marszałkowskiego Województwa Pomorskiego specjalistyczna analiza dynamiki rozwoju ISP pozwoliła na spojrzenie i ocenę relacji zachodzących pomiędzy podmiotami prowadzącymi działalność w obszarze ISP i pozostałymi podmiotami lokalnej gospodarki. „Zidentyfikowano blisko 16,5 tys. przedsiębiorstw funkcjonujących na obszarze województwa pomorskiego i prowadzących działalność w obszarze przynajmniej jednej inteligentnej specjalizacji. Choć w stosunku do liczby podmiotów gospodarczych ogółem nie jest to bardzo liczna grupa, to tworzą ją przedsiębiorstwa potrafiące wykorzystać unikatowe zasoby dostępne w obszarze ich lokalizacji do wytworzenia przewagi konkurencyjnej" (Tarkowski et al. 2021, s. 6-7). Wyniki zrealizowanego badania w formule tzw. badania szytego na miarę wprost pod potrzeby monitorowania Inteligentnych Specjalizacji Pomorza, dostarczyły następujących kluczowych wniosków i obserwacji:

- Podmioty z obszaru ISP wyraźnie częściej prowadzą działalność eksportową, wprowadzają innowacje, lepiej się odnajdują w trudnych warunkach pandemii, powszechniej wykorzystują technologie cyfrowe, szkolą pracowników, w tym w zakresie zaawansowanych kompetencji innowacyjnych.
- Kluczowym wyróżnikiem firm z obszarów ISP jest prowadzenie prac B+R. Tego typu aktywność podejmuje co piąte przedsiebiorstwo z obszaru ISP i niespełna 4% firm spoza ISP.

3 W tekście publikacji zastosowano uproszczoną nazwę poszczególnych Inteligentnych Specjalizacji Pomorza. Pełne nazwy brzmią następująco:
Specjalizacja morska – tzw. ISP 1 – Technologie offshore i portowo-logistyczne.
Specjalizacja ICT – tzw. ISP 2 – Technologie interaktywne w środowisku nasyconym informacyjnie.
Specjalizacja energetyczna – tzw. ISP 3 – Technologie ekoefektywne w produkcji, przesyle, dystrybucji i zużyciu energii w paliw oraz w budownictwie.
Specjalizacja zdrowotna – tzw. ISP 4 – Technologie medyczne w zakresie chorób cywilizacyjnych i okresu starzenia.

- Firmy działające w zakresie ISP okazują się bardziej aktywne i osiągają lepsze wyniki finansowe w porównaniu do tych, które funkcjonują poza ISP.
- Podmioty z obszaru ISP są bardziej otwarte na współpracę z instytucjami otoczenia biznesu i z ośrodkami badawczymi.
- Przedsiębiorstwa prowadzące działalność w obszarach ISP z większym optymizmem oceniają zmiany swojej sytuacji w latach 2015-2019 niż firmy spoza ISP. Prawie 60% badanych związanych z inteligentnymi specjalizacjami oceniło, że ich ogólna sytuacja w analizowanym okresie poprawiła się (w przypadku respondentów spoza ISP na poprawę wskazało niespełna 53%).
- Tym, co pozytywnie odróżnia firmy z obszaru ISP od tych, które funkcjonują poza tym obszarem, jest stosowanie procesów automatyzacji oraz cyfryzacji. Automatyzację wprowadziło do czasu realizacji badania 22,5% przedsiębiorstw z obszaru ISP i 14,6% spoza ISP. Natomiast w odniesieniu do cyfryzacji odsetki firm ją wykorzystujących wynoszą odpowiednio 58,3% oraz 35,1% (skrót wniosków przedstawiono na podstawie: Tarkowski et al. 2021, s. 6-9).

Biorąc to pod uwagę, można zaryzykować stwierdzenie, że rola przedsiębiorstw, które prowadzą działalność w obszarach zidentyfikowanych jako ISP, w porównaniu z firmami spoza ISP, jest większa i bardziej pozytywna w kształtowaniu rozwoju gospodarczego, a tym samym pewnego stopnia dobrobytu na terenie województwa pomorskiego. Pomimo tak jednoznacznych benefitów pozostawania w grupie podmiotów ISP z badania wyłania się pewien paradoks związany z brakiem znajomości samej idei ISP, jak i przynależności firmy do danego jej obszaru, a tym samym korzyści z tym związanych. Zrealizowane badanie pokazuje także, że innowacje podejmowane w pomorskich firmach są przede wszystkim finansowane ze środków własnych, co z pewnością ogranicza ich potencjał. W ramach Programu Regionalnego Województwa Pomorskiego na lata 2014-2020 pozyskano dofinansowanie na realizację tylko „67 projektów B+R o wartości 655,5 mln zł, z czego poziom ich dofinansowania z UE wyniósł 399,7 mln zł" (Raport… 2023, s. 8). Do tej pory ukończono 18 projektów, co podkreśla poziom ich trudności i ryzyka. Paradoks ISP dotyczy także współpracy z instytucjami otoczenia biznesu – z jednej strony firmy ISP cechuje otwartość na tego typu współpracę, z drugiej podmioty te wykazują niską świadomość istnienia IOB oraz znajomości oferty usług specjalistycznych. Potrzebne są zdecydowane działania władz lokalnych w postaci pilnej potrzeby poprawy komunikacji i promocji ISP, aby zwiększyć krąg podmiotów zainteresowanych ofertą wsparcia, zwłaszcza w kontekście nowych szans dofinansowania innowacyjnych projektów w nowej perspektywie finansowej na lata 2021-2027.

6. Nowoczesne technologie wymagają kompetencji przyszłości

Intensywny rozwój technologii oraz otwartość firm na podejmowanie innowacji stymuluje szereg zmian na rynku pracy oraz tworzenie zupełnie nowych zawodów, a co za tym idzie – także nowych kompetencji wśród pracowników. Z dużym prawdopodobieństwem najbardziej kluczowa stanie się umiejętność łączenia kompetencji miękkich (związanych m.in. z elastycznym podejściem do szybkiego uczenia się, kreatywnością czy otwartością na rozwiązywanie problemów) z umiejętnościami cyfrowymi, związanymi z tak szybkim postępem w obszarze szeroko rozumianej branży ICT, która wywiera wpływ na rozwój także innych gałęzi gospodarki.

Branżowi specjaliści coraz więcej wysiłku wkładają także w określenie kompetencji przyszłości rozumianych jako „zdolności do podejmowania określonych działań i wykonywania zadań z zastosowaniem efektów uczenia się oraz własnych doświadczeń, które zostały przez danego pracownika nabyte intencjonalnie oraz nieintencjonalnie" (www.przemyslprzyszlosci.gov.pl). Szacuje się, że popyt na kompetencje przyszłości nastąpi już w okresie najbliższych 3-5 lat, a ich opanowanie wymusza coraz bardziej dynamiczny rozwój przemysłu. Eksperci Obserwatorium Kompetencji Przyszłości Fundacji Platforma Przemysłu Przyszłości opracowali 16 kompetencji uznanych właśnie jako kompetencje przyszłości. Są one dzielone na trzy kategorie:

- „kompetencje poznawcze (kognitywne),
- kompetencje techniczne oraz w zakresie posługiwania się, a także zarządzania informacją i wiedzą oraz
- kompetencje społeczne" (Łapińska, Sudolska, Zinecker 2022, s. 15-16).

„Coraz większe znaczenie dla konkurencyjności gospodarek ma zdolność do przyciągania, rozwijania i zatrzymywania talentów. Szybko postępująca globalizacja i związana z tym mobilność pracowników sprawiły, że zabieganie o talenty przeniosło się na poziom państw, regionów i miast" (Regionalny… 2023, s. 5).

7. Paradoks dobrobytu innowacji. „Za wyjście z opresji zawsze będziemy musieli zapłacić"

W wielkim uproszczeniu innowacje to szansa na stworzenie lub poprawę wielu produktów i usług, a tym samym jakości życia współczesnego społeczeństwa i jego dobrobytu. Tak dynamiczny rozwój nowoczesnych technologii, zwłaszcza w aspekcie technologii cyfrowych tak lubianych przez dzieci, młodzież i obecne młode pokolenie, ma jednak swoją cenę i konsekwencje. Natalia Hatalska, znana futurolożka, przywo-

łuje zjawisko tzw. zemsty technologicznej – „nawet jeśli technologia rozwiązuje jakiś problem tu i teraz, to w przyszłości generuje kolejny, którego pierwotnie nie dało się przewidzieć" (Hatalska 2021, s. 31). Intensywny postęp technologiczny coraz bardziej przenosi nas wręcz ze świata fizycznego do wirtualnego. Wszechobecność internetu czy mediów społecznościowych powoduje, że jesteśmy 24 godziny na dobę w trybie online, co z jednej strony ułatwia pracę czy komunikację z bliskimi, ale przynosi często poważne konsekwencje społeczne w postaci dezinformacji, manipulacji informacjami oraz poczucia osamotnienia i utraty zdolności do budowania relacji w wymiarze fizycznym. Zaburza to obraz dążenia do dobrobytu społecznego oraz poczucia realnego szczęścia. Dodatkowo wiele osób, chociaż korzysta z najnowszych technologii cyfrowych, kompletnie nie rozumie ich funkcjonowania, co skutkuje tym, że wręcz oddaje swoje życie władzy algorytmów. Kluczowa jest w tym aspekcie nowa jakość edukacji – edukacji o kontroli technologii nad naszym życiem, tak aby to człowiek miał technologię w posiadaniu, a nie odwrotnie. Z pewnością jest to także kluczowe w obliczu tak intensywnego rozwoju sztucznej inteligencji oraz wielu innych narzędzi pozornie poprawiających nasze poczucie dobrobytu w wymiarze gospodarczym i społecznym.

8. Podsumowanie

Rozwój nowoczesnych technologii w ostatnich kilkudziesięciu latach stał się po części modą, po części koniecznością wymuszoną przez oczekiwania społeczeństw w kierunku poprawy jakości i długości życia, a w konsekwencji poczucia dobrobytu. Polska, pomimo mało satysfakcjonujących wyników w globalnych czy europejskich rankingach przedsiębiorczości czy innowacyjności, stara się zdecydowanie wrzucić piąty bieg w kierunku podejmowania działań kreujących lub ulepszających produkty i usługi dostępne na rynku. Polityka Unii Europejskiej od wielu już lat koncentruje się także na wspieraniu unikalnych zasobów w regionach, określanych mianem inteligentnych specjalizacji, które to otrzymują priorytetowy dostęp do dofinansowania. Analiza przeprowadzona na przykładzie województwa pomorskiego pokazuje słuszność obranej drogi, jasno wskazując, że przedsiębiorstwa podejmujące działalność innowacyjną w konsekwencji uzyskują lepsze wyniki finansowe, częściej podejmują działalność eksportową czy szkolą swoich pracowników. Tak szybki rozwój nowoczesnych technologii ma jednak swoje paradoksalne konsekwencje. Z jednej strony polityka unijna jasno pokazuje kierunek koncentracji na finansowaniu nowoczesnych produktów badawczo-rozwojowych, często tworzących nowoczesne technologie, z drugiej

– ewolucyjnie zmysły człowieka nie są przystosowane do tak szybkiego nadążania za coraz nowszymi narzędziami, produktami i ich funkcjonalnością, skazując wielu z nas na życie we władzy algorytmów. Wydawać by się mogło, że ogół tych dynamicznych zmian wpływa pozytywnie na kształtowanie dobrobytu społeczeństw i gospodarek na całym świecie, z drugiej jednak strony wpływa na konieczność zmian m.in. w obszarach edukacji i kształtowania kompetencji przyszłości czy ogromne poczucie samotności i dezinformacji. Dlatego niezbędne jest poszukiwanie równowagi. Tak aby to człowiek posiadał technologię, a nie technologia człowieka. I tym samym dążył do zdrowia i szczęścia określanego jako synonimy dobrobytu.

Bibliografia

Bogdański M., Strzała K., 2019, *Dobrobyt w krajach UE – hipoteza podwójnego deficytu* [w:] *Oblicza dobrobytu. Wybrane zagadnienia. Tom IV,* red. K. Strzała, Gdańsk.

European Innovation Scoreboard, 2022, European Commission, Brussels.

Hatalska N., 2021, *Wiek paradoksów*, Kraków.

Innowacje jako skuteczna droga rozwoju polskich biznesów. Już 4 na 5 firm podejmuje aktywność innowacyjną, https://www.parp.gov.pl/component/content/article/83299:innowacje-jako-skuteczna-droga-rozwoju-polskich-biznesow-juz-4-na-5-firm-podejmuje-aktywnosc-innowacyjna [dostęp: 2.05.2023].

Kwaśnicki W., *Innowacje – koło zamachowe rozwoju cywilizacyjnego,* https://www.obserwatorfinansowy.pl/tematyka/makroekonomia/trendy-gospodarcze/innowacje-kolo-zamachowe-rozwoju-cywilizacyjnego/ [dostęp: 1.05.2023].

Łapińska J., Sudolska A., Zinecker M., 2022, *Raport z badań empirycznych w zakresie kompetencji i zawodów przyszłości,* Obserwatorium Kompetencji Przyszłości Fundacji Platforma Przemysłu Przyszłości.

Narodowy System Innowacyjności: szanse i wyzwania 2022, Ośrodek Przetwarzania Informacji – Państwowy Instytut Badawczy.

Przyszłość kompetencji przyszłości – bezpłatny raport dla przedsiębiorców, https://przemyslprzyszlosci.gov.pl/przyszlosc-kompetencji-przyszlosci-bezplatny-raport-dla-przedsiebiorcow/ [dostęp: 2.05.2023].

Radło M., Napiórkowski T., Szczech-Pietkiewicz E., 2020, *Dobrobyt, wzrost gospodarczy i ich nierównomierność w regionie. Wybrane modele, mechanizmy i orientacje polityki rozwojowej*, Warszawa.

Raport z realizacji Regionalnego Programu Operacyjnego Województwa Pomorskiego na lata 2014-2020, 2023, Samorząd Województwa Pomorskiego.

Regionalny Program Strategiczny w zakresie gospodarki, rynku pracy, oferty turystycznej i czasu wolnego, 2023, Załącznik nr 1 do uchwały nr 61/421/23 Zarządu Województwa Pomorskiego z dnia 17 stycznia 2023 r.

Sopińska A., 2018, *Kreatywność a innowacyjność organizacji. Otwarte innowacje jako przejaw współkreatywności* [w:] *Studia i Prace Kolegium Zarządzania i Finansów*, Warszawa.

Tarkowski M., Dominiak P., Zięba K., Kostelecka A., 2021, *Analiza dynamiki rozwoju Inteligentnych Specjalizacji Pomorza (ISP) oraz potrzeb kompetencyjnych podmiotów gospodarczych wpisujących się w obszary ISP prowadzących działalność na terenie województwa pomorskiego. Raport główny.*

Tarnawa A. (red.), 2022, *Raport z badania przedsiębiorczości Global Entrepreneurship Monitor Polska 2022*

Tutaj J., 2019, *Innowacje – próba pomiaru* [w:] *Innowacje a dobrostan społeczeństwa, gospodarki i przedsiębiorstw. Próba pomiaru,* red. Z. Malara, J. Tutaj, Wrocław.

Ulga na badania i rozwój, https://www.gov.pl/web/rozwoj-technologia/ulga-na-badania-i-rozwoj [dostęp: 2.05.2023].

Wegner M. (red.), 2022, *Działalność badawcza i rozwojowa w Polsce w 2021 r.*, Urząd Statystyczny w Szczecinie.

Wronowska G., 2015, *Dobrobyt – ujęcie teoretyczne i pomiar*, „Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie", nr 12.

Żero S., 2018, *Różnice w interpretacji pojęć innowacji oraz imitacji przedmiotu* [w:] *Współczesne problemy ekonomiczne w badaniach młodych naukowców. T. 2, Zarządzanie organizacją, finanse i inwestycje*, red. E. Gruszewska, A. Matel, E. Kuzionko-Ochrymiuk, Warszawa.

Streszczenie

W artykule przedstawiam kwestie związane z pojęciami innowacyjności i dobrobytu, statystyką poziomu innowacyjności w skali kraju i województwa pomorskiego. Zasadniczą częścią jest analiza dynamiki rozwoju Inteligentnych Specjalizacji Pomorza w kontekście dążenia do poprawy jakości i poziomu życia. Wartością dodaną tekstu jest wskazanie paradoksów związanych z tak intensywnym rozwojem nowoczesnych technologii w postaci tzw. zemsty technologicznej.

Słowa kluczowe: innowacje, pomiar innowacyjności, dobrobyt, inteligentne specjalizacje, inteligentne specjalizacje Pomorza, przedsiębiorczość, nowoczesne technologie, paradoks nowoczesnych technologii

Kody JEL: M2, O0, O3 (O33, O35, O36)

Abdurahmon Habibov[1], Shuhratjon Nazarov[2]

About problems of innovational development of the food industry in Tajikistan

1. Introduction

Sustainable development of any country in modern conditions is inextricably linked to the development of its industry. Industry should serve as a locomotive for the development of the national economy. In the Republic of Tajikistan, where there is sufficient natural and economic potential, industries should develop at a faster rate. At the current stage, along with the strengthening of the role of geographical, demographic, administrative and economic aspects, the role of innovative factors in the sustainable development and industrialization of the country is increasing significantly.

Food is a necessary condition for human life, which requires a combination of inorganic and organic substances for normal activity, the intake of which ensures the construction and restoration of tissues, recovery of spent energy. In fulfilling this condition, the food industry plays a decisive role, which provides the food needs of the population. The latter requires a regular increase in the volume of production, expansion of the list of products, increase in competition and improvement of product quality by introducing innovative activities.

One of the important factors of the sustainable development of the national economy is the development and implementation of an effective innovation policy, which determines the main goal of introducing new technologies, inventions, forms of pro-

1 Candidate of economical sciences, Technological University of Tajikistan & Institute for studying of the problems of Asian and European countries National Academy of Sciences of Tajikistan

2 Candidate of technical sciences, Technological University of Tajikistan

duction management and labor organization, which are based on the achievements of scientific and technical progress.

Scientific and technical progress is an activity related to the in-depth study of the laws of the development of nature and society, on the basis of which tools and objects of labor, production processes, forms of organization of production and economy are created and improved. Scientific and technical progress, which includes the process of improving the material and technical base, production of products using the latest achievements of scientific research and design work, is designed to meet the needs of society[3].

It is known that the development of scientific and technical progress takes place in evolutionary, revolutionary and combined forms. At the same time, the direct result of scientific and technical progress is innovation.

2. Research methods

The methodology of the research is based on the popular scientific methods and principles, which can provide the reliability of the results. A systematic approach has used in this chapter, where were analyzed the main problems of the innovative development of the national food industry in their relevance interdependently. Owing to the application of this approach, the reliance of innovation development on economic changes and globalization forms within the world economic framework has been built up[4].

To attain the research objective and unravel certain tasks, in the paper have been used the monographic, abstract-logical, economic-statistical, analysis and synthesis, computational and constructive, comparative analysis methods[5].

3. Results and discussion

As the analysis of various sources showed, there are different approaches to the formation of the concept of innovation. In particular, innovation as a new order[6], the result of the efforts of a prominent person[7], changing the traditional work pro-

3 Glazyev 2010, p. 255.
4 Kilimova et al., 2021
5 Kilimova et al., 2021
6 Schumpeter 1982, p. 456
7 Foster 1987, p. 272

cess[8], design, process, approach, new style[9], the process of implementing ideas and inventions[10], commercialization of a new idea[11], a special tool for entrepreneurs[12], the final result of innovative activity[13], qualitative changes in production[14] are understood.

Thus, innovation can be understood as a qualitative change in the technique and technology of production, forms of organization and management of production, which provides a qualitatively new level of development of productive forces, an increase in the profitability of production[15].

Innovation is driven by external factors such as competition, consumer demand, limited resources, etc.[16] In order to be competitive and maintain their position in the market, companies must take these factors into account to change their behavior and strategy.

The analysis of the modern trends of reproduction in the conditions of the economic development of the republic is the basis for introducing the connection of scientific and technical progress with the concept of the innovation process, which includes the whole set of relations for production, exchange, consumption and distribution by combining science, technology and economy[17]. The connection of innovative processes with all aspects of the state economic policy, which is aimed at the intensive sources of economic development, the development of the national economy through the implementation of innovative processes with the necessary investment resources, can be observed. Funding should be sufficient both for production support and for the formation of the most rational technological structure, which will provide and create conditions for increasing the efficiency of the national economy.

Based on the above, it can be concluded that the innovative process is an effective tool for the development of the national economy and its branches, including the food industry.

Whereas earlier in the scientific literature the innovative activity of the food industry was considered low[18], over time, innovation began to play an important role in the

8 Nelson & Unter 2000, p. 418
9 Porter 2003, p. 674
10 Santo 1990, p. 291; Twiss 2009, p. 272
11 Morozov 2008, p. 274
12 Drucker 2008, p. 432
13 Komilov & Faizulloev 2004, p. 118
14 Yakovets 2004, p. 439
15 Sultanov & Habibov 2019, p. 174
16 Damanpour & Schneider 2009, p. 495-522
17 Pimenov 2012, p. 371
18 Martinez & Briz 2004, p. 155-176

development of this industry[19]. In practice, the food industry appears to be conservative and lagging behind some fast-growing industries, due to insufficient investment in R&D[20].

In recent years, under the influence of various social, economic and technological factors, the food industry has undergone significant changes along the entire food production chain, right up to their distribution to final consumers. Also, this industry is characterized by a high level of competition, which predetermined the development of innovative activity, inevitable for the further success of enterprises. In this regard, food companies are actively seeking to develop and implement innovations[21].

For a long time, food industry enterprises have set the main goal of reducing production costs, often without taking into account the opinion of consumers of products[22]. Over time, they realized the importance of this factor and began to focus on the quality and safety of their products. As a result of this inversion, end users were actively involved in the development and formation of products and their quality based on their needs and preferences[23]. This reinforced the importance of innovation in the development of the industry, which contributed to the expansion of the range of food products[24].

In this regard, food enterprises have stepped up innovation and technological processes to develop new types of products, which have led to the emergence of new business models. In this case, most companies rely on their own developments and innovations. But there are also companies that design their new products on the basis of innovative solutions of other enterprises in the industry, which shows the difficulties of developing and managing innovations[25].

The basis of the innovative way of development of the food industry is scientific and technical policy, which acts as one of the main components of the socio-economic policy of the country, which requires regular implementation of innovative activities[26].

The development of innovative activity is closely related to the development of science and technology, and this depends on the objective situation, because in the conditions of limited natural and economic resources, the development of industry depends less on the

19 Menrad 2004, p. 845-878
20 Costa & Jongen 2006, p. 457-465
21 Capitanio et al 2010, p. 503-518
22 Bigliardi & Galati 2013, p. 16-26
23 Aguilera 2006, p. 1147-1155
24 Omta & Folstar 2005, p. 223-246
25 Sarkar & Costa 2008, p. 574-580
26 Habibov 2021, p. 155-159

quantitative description of the development of science and technology and more on the speed and quality of the implementation of the results of the activity. Scientific research is related to new technical and technological forms, which should be transformed into new products and technologies. In these conditions, stimulating innovative activity is the most important direction of scientific and technical policy.

To explain the understanding of the relationship between science and production and the national economy, the linear innovation model[27] was previously used as a linear sequence of functional actions. This model was first proposed by Holland in the 20s years of the last century, which was based on the development of industrial sectors, reducing the time for introducing scientific discoveries into production by increasing investment in scientific development. He singled out the following stages of innovation: research and development, applied research, invention, preparation of an industrial design, industrial production, standardization and mass production.

To match today's realities, a pre-research stage was added to this model[28], in which market opportunities are explored and brainstorming is carried out to identify new promising ideas. The advantage of this method is the ability to improve the skills of company employees to transform innovative ideas into new products, technologies and processes. The continuous implementation of innovative processes at these stages allows you to reduce the time for developing new products and create innovations in a streaming way, which will contribute to the sustainability of competition in the market. However, this model is also conditioned by a rigid sequence, during which it is not possible to evaluate the process of creating new innovative ideas.

This shortcoming is addressed by the concept of open innovation, which was first introduced by Chesbrough[29], who defined it as "a set of practices for profiting from innovation, as well as a cognitive model for creating, interpreting, and exploring these practices".

This concept is based on the idea that in today's competitive environment in which companies operate, a linear model of innovation can no longer adequately clarify innovation activity[30].

However, when using an open innovation model, companies may be more vulnerable to protecting their knowledge[31], which increases the level of associated risk. It can also cause a decrease in competitive advantages and have a negative impact on its

27 Godin 2006, p. 639-667
28 Cooper 2014, p. 20-31
29 Chesbrough 2003
30 Bigliardi et al., 2020
31 Galati et al. 2019

sustainability in the market in the long term. For this reason, knowledge sharing is a major risk in open innovation, and hence some companies are moving away from this approach to reduce the risk of their data being leaked.

An example of the successful application of open innovation in the food industry is the development of a new product, crispbread[32], which was realized through the export of products from an agricultural country and a country with a high labor cost.

When implementing open innovation in the food industry, manufacturers have significantly changed their behavior[33]. Positive can be considered the access of companies to new knowledge and the receipt of additional profit from the distribution of costs and risks of innovation, as well as from the reduction of the time period for new products to enter the market. Also, as a result of paying more attention to the creative processes developed within the companies, it was possible to increase the range of products on the market and strictly monitor its technological changes.

Despite the differences and tensions between sustainability and innovation[34], according to Franceschelli et al.[35], innovation can be a driving force in the sustainable development of the food industry and contribute to the sustainability of food enterprises. In fact, currently the task of innovative development of the food industry is to solve two main problems of our time, namely the protection of the environment and ensuring global food security[36]. In this regard, the problems of sustainability and innovative development of the food industry in recent years have been very relevant[37]. However, various terms have emerged to refer to such innovations, such as sustainable innovation, eco-innovation, green innovation, and so on. As a result of the need for mutual collaboration in this area, the concept of open innovation for sustainable innovation has emerged[38].

In the conditions of the Republic of Tajikistan, the development of the food industry needs to accelerate innovative activities, which requires a lot of investment. On the other hand, it is difficult to overcome inflation and recession without innovation.

It is possible to deal with the limited state resources on the basis of reasonable interdisciplinary use and spending them on production with a high level of technological development. In connection with this, there is a need to develop a system of priority measures for the innovative activity of economic entities and their support by the sta-

32 Grimsby & Kure, 2019

33 for example, Bayona-Saez et al., 2017

34 Rauter et al. 2017, p. 249-270

35 Franceschelli et al. 2018, p. 2483-2494

36 for example, King et al. 2017, p. 160-175

37 for example, Emamisaleh et al., 2018; Franceschelli et al. 2018, p. 2483-2494

38 Bigliardi 2019, p. 85-99

te. Innovative projects should be selected considering their efficiency and importance from different perspectives.

The shortcomings of the transition period and market reforms, which were intensified as a result of crisis processes, had a negative impact on the state of innovative activity of the food industry, which is characterized by a low level of assimilation of new technologies, modern equipment, materials and other achievements. The reasons for this situation are as follows: insufficient financing of scientific research and development work, low level of innovative activity of enterprises, their difficult financial situation, almost complete lack of demand for scientific and technical products by the private sector of the economy, which leads to a decrease in the amount of scientific research, a decrease in scientific and technical potential, as well as the decline of inventive and rationalization activity in the real sector of the economy.

Among the reasons that hinder innovative activity, there is also the real withdrawal of the state from the field of activity related to the development and implementation of innovations as a result of the lack of funds for investment in innovative technological processes, the unavailability of financial resources of producers of goods in the market due to "high cost", high risk of financing innovative projects, etc. are considered

It is necessary to provide a state system for regulating the innovative activities of enterprises, which includes such economic mechanisms as planning and forecasting of scientific and technical progress, stimulation of relations between science and production, differential taxation, flexible consumption system, indicative planning, etc., which increase trends prevent the negative[39].

In accordance with the state policy, the necessary grounds for the development of the food industry have appeared in recent years, which requires new scientific and organizational foundations. These principles should be based on a unified policy of innovative development.

Innovative development of the food industry involves not only the creation of products, technology, technical tools, but also innovative infrastructure. In the conditions of the republic, it is necessary to pay special attention to the processing of perishable products near the place of cultivation, the use of new types of raw materials, which the nature of Tajikistan is rich in, and increasing the efficiency of production due to mechanization and automation.

Naturally, developers of scientific and technical products and producers of goods are interested in the development of innovative processes, especially in terms of their implementation. In the current conditions of the transition to the market economy,

39 Rakhimov 2010, p. 140-143

the relationship between them should be based on mutual benefit, that is, the inventor of the innovation to sell his scientific products and the producer of goods to use and receive economic benefits.

For this, manufacturers should have more information about environmentally friendly and energy-efficient technologies in the industry[40]. Therefore, in our opinion, the organization and regular completion of special databases for production with the necessary information from scientific institutions and innovative organizations, their connection to a single information system, seems to be an urgent necessity.

To gain external knowledge and adapt to various macroeconomic changes, food companies need to move towards an open innovation model[41]. They can complement and extend existing traditional models. The emergence of new technological opportunities in the near future will pose new challenges for the food industry. The food industry can produce products based on new processing methods, using advances in biotechnology science, or functional foods to expand the product range and gain new market niches[42]. The use of nanotechnologies in the industry, which, however, requires significant investments, can also be considered an interesting direction[43].

Developments in genetics, new materials, and communication technologies have effectively revolutionized the way food is produced, sold, and consumed[44]. In this regard, the idea of food itself has also changed, now it is not only a consumer product to meet the physiological needs of a person, but a product that takes into account all stages of creation and implementation before consumption, as well as the direction of the enterprise. As a result, the role of such factors as medical, environmental, social and economic factors has increased.

As the analysis of scientific and technical information showed, the intensification of processes based on new physical methods of processing raw materials and products, wide use of low- and zero-waste technologies, energy saving, membrane technology, productive automation equipment is typical for foreign countries with industrial potential. Currently, the material and technical base of domestic production does not fully meet the requirements of scientific and technical progress.

Regular updating of production equipment and technology is the basis of the normal work of enterprises, and innovation is the determining factor of scientific and technical progress and, therefore, the development of the food industry.

40 Zlobin & Blagoveshchenskaya 2005, p. 768

41 for example, Bayona-Saez et al., 2017

42 Santeramo et al. 2018, p. 39-47

43 for example, He et al. 2019, p. 1-21

44 Dawson et al. 2019, p. 37-54

Currently, there is a certain amount of competitive scientific and technical offer in the food industry of the republic. The lack of demand for these proposals is explained by the lack of awareness and enthusiasm of industrial enterprises to change the established production of products, the lack of capital for the implementation of innovative projects. Managers of new enterprises prefer installation of imported equipment and technology to the use of innovative, energy-efficient modern technologies.

Therefore, innovative technologies in the food industry can include:

- development and practical application of agricultural product storage technologies;
- implementation of energy-efficient technologies;
- improvement of technological processes in order to reduce production cycle time without loss of product quality;
- development and implementation of techniques and technologies of new packaging solutions;
- improvement of containers for packing and delivery methods;
- processing and production of environmentally friendly products for dietary and medical purposes, including non-traditional raw materials;
- development and production of products taking into account the individual characteristics of different population groups;
- increasing product quality through certification and standardization[45].

4. Conclusion

Innovation is a qualitative change in production and refers to technique, technology, forms of organization of production and management. They are intended for a qualitatively new level of development of the productive forces, increasing the efficiency of production and solving the problem of meeting the needs of the country's population with food products at the expense of domestic production. For the modern conditions of our republic, it is interesting to use the open innovation model, but our scientists pay little attention to its study.

It follows from this that the perspective issues of economic and technical sciences in the food industry, which contribute to the formation and effective use of innovative factors, are the development of waste-free, economical and environmentally safe production with improved technical and economic characteristics, a high degree of automation and mechanization of technological processes; the use of biotechnologi-

45 Sultanov & Habibov 2019, p. 174

cal and physico-chemical methods for the development of new types of high-quality products, taking into account modern recommendations on the rational structure of food products and nutritional standards.

References:

a) in English

Aguilera J.M., 2006, *Seligman Lecture 2005: food product engineering: building the right structures*, "Journal of the Science of Food and Agriculture', vol. 86.

Bayona-Saez C., Cruz-Cázares C., García-Marco T., García M.S., 2017, *Open innovation in the food and beverage industry.* Management Decision.

Bigliardi B. 2019, *Open innovation and traditional food* [w:] *Innovations in traditional foods* Woodhead Publishing.

Bigliardi B., Galati F., 2013 *Models of adoption of open innovation within the food industry*, "Trends in Food Science & Technology", vol. 30(1).

Bigliardi B., Ferraro G., Filippelli S., Galati F., 2020, *The past, present and future of open innovation*, "European Journal of Innovation Management", doi: 10.1108/EJIM-10-2019-0296.

Capitanio F., Coppola A., Pascucci S., 2010, *Product and process innovation in the Italian food industry*, "Agribusiness: An International Journal", vol. 26.

Chesbrough H., 2003, *Open innovation: the new imperative for creating and profiting from technology.* Boston, MA: HBS Press.

Cooper R.G., 2014, *What's next?: After stage-gate*, "Research-Technology Management", vol. 57(1).

Costa A.I.A., Jongen W.M.F., 2006, *New insights into consumer-led food product development*, "Trends in Food Science and Technology", vol. 17(8).

Damanpour F., Schneider M., 2009, *Characteristics of innovation and innovation adoption in public organizations: assessing the role of managers*, "Journal of Public Administration Research and Theory", vol. 19(3).

Dawson I.K., Powell W., Hendre P., Bančič J., Hickey J. M., Kindt R., ... Jamnadass R., 2019, *The role of genetics in mainstreaming the production of new and orphan crops to diversify food systems and support human nutrition.* "New Phytologist", vol. 224(1).

Emamisaleh K., Rahmani K., Iranzadeh S., 2018, *Sustainable supply chain management practices and sustainability performance in the food industry.* "The South East Asian Journal of Management.

Franceschelli M.V., Santoro G., Candelo E., 2018, *Business model innovation for sustainability: a food start-up case study,* "British Food Journal", vol. 12(10).

Galati F., Bigliardi B., Petroni A., Petroni G., Ferraro G., 2019, *A framework for avoiding knowledge leakage: evidence from enginnering to order firms.* Knowledge Management Research & Practice, doi: 10.1080/14778238.2019.1638736.

Godin B., 2006, *The linear model of innovation, the historical construction of an analytical framework*, "Science, Technology, & Human Values", vol. 31(6).

Grimsby S., Kure C.F., 2019, *How open is food innovation? The crispbread case*, "British Food Journal".

He X., Deng H., Hwang H.M. 2019, *The current application of nanotechnology in food and agriculture,* "Journal of Food and Drug Analysis", vol. 27(1).

Kilimova L., Cherkashin M., Pykhtin A., Kolmykova T., 2021, *Managing the innovative development of the food industry.* BIO Web Conf. 32 03017 DOI: 10.1051/bioconf/20213203017.

King T., Cole M., Farber J.M., Eisenbrand G., Zabaras D., Fox E. M., Hill J.P., 2017, *Food safety for food security: Relationship between global megatrends and developments in food safety*, "Trends in Food Science & Technology', vol. 68.

Martinez M.G., Briz J., 2004, *Innovation in the Spanish food & drink industry*, "International Food and Agribusiness Management Review"**,** vol. 3(2).

Menrad K., 2004, *Innovation in the food industry in Germany*, "Research Policy", vol. 33(6-7).

Omta S.W.F., Folstar P., 2005, *Integration of innovation in the corporate strategy of agri-food companies* [w:] *Innovation in agri-food systems*, eds. W.M.H. Jongen, M.T.G. Meulenberg, Wageningen.

Rauter R., Perl-Vorbach E., Baumgartner R.J., 2017, *Is open innovation supporting sustainable innovation? Findings based on a systematic, explorative analysis of existing literature*, "International Journal of Innovation and Sustainable Development", vol. 11 (2-3).

Santeramo F.G., Carlucci D., De Devitiis B., Seccia A., Stasi A., Viscecchia R., Nardone G., 2018, *Emerging trends in European food, diets and food industry*, "Food Research International", vol. 104.

Sarkar S., Costa A.I.A., 2008, *Dynamics of open innovation in the food industry*, "Trends in Food Science and Technology', vol. 19.

b) in Russian

Drucker P.F., 2008, *Business and innovation*/transl. from English. Williams.

Foster R., 1987, *Production update: attackers win*/transl. from English. Progress.

Glazyev S.Yu., 2010*, Russia's Advanced Development Strategy in the Conditions of the Global Crisis*, "Economics".

Habibov A.H., 2021, *Some aspects of innovative development of the food industry in the Republic of Tajikistan*, "Humanitarian, socio-economic and social sciences', vol. 12.

Komilov S.J., Faizulloev M.K., 2004, *Fundamentals of development of innovative activity of enterprises*. Irfon.

Morozov Yu.P., 2008, *Innovation management*. Unity-Dana.

Nelson R., Unter S., 2000, *Evolutionary theory of economic changes*/transl. from English. Finstatinform.

Pimenov S.V., 2012, *Innovative support for the development of food industry enterprises*/dissertation ... Doctor of Economics Sciences: 08.00.05. St. Petersburg.

Porter M.E., 2003, *Competition*/transl. from English. Publishing House "William".

Rakhimov O.N., 2010, *State regulation of innovation activity in the Republic of Tajikistan*. Bulletin of TNU, vol. 8 (64).

Santo B., 1990, *Innovation as a means of economic development*/transl. from English. Progress.

Schumpeter J.A., 1982, *Theory of economic development*/transl. from English. Progress.

Sultanov Z.S., Habibov A.H., 2019, *Efficiency of innovative and technological development of the regional food subcomplex.* Publishing house RTSU.

Twiss B., 2009, *Innovation management*/transl. from English. Economics.

Yakovets Yu.V., 2004, *Epochal innovations of the XXI century*. Economy.

Zlobin L.A., Blagoveshchenskaya M.M., 2005, *Information technology of process control systems.* Higher School.

Summary

The development of the national economy of world countries based on innovations is the basis of their development model. Our republic is also striving to develop its economy, for which the necessary measures are being taken to intensify innovation in various sectors of the economy. The article discusses some problems of innovative development of the food industry, which can contribute to ensuring food security and access of the population to healthy food. Also various interpretations of the concept of innovation are analyzed, the problems of the development of the food industry are updated, the need to strengthen the connection between science and production is indicated, the possibilities of using open innovations in this industry are considered using examples, the current state of the functioning of the food industry is assessed, the reasons for the low innovative activity of food enterprises are identified, the main ways of innovative development of the food industry are proposed.

Keywords: problems, innovation, development, open innovation, food industry, Republic of Tajikistan, enterprises, science, model, sustainability, technologies.

JEL Classification codes

O320 Management of Technological Innovation and R&D

L660 Food; Beverages; Cosmetics; Tobacco; Wine and Spirits

Dhivya Sathish*, M. Lavanya*

Effects of digital marketing on consumers, with a focus on Chennai's fashion industry

Introduction

The fashion sector drives a significant portion of the global economy and ranges from global budget shops to upscale luxury firms. Fashion is one of the most challenging industries to work in because of the instability of the global economy, as well as various trends and technological advancements. A number of brands have launched a number of initiatives to improve their products to the world with innovative styles, producing methods, and also to provide a chair processes to final customers to withstand in a marketplace because this industry involves constant innovations, pressure for growth, and value potency.

Small Scale Business Men use Digital Marketing as a tool to develop their businesses where they can easily get Customers through many social media platforms like Instagram, Facebook, YouTube, or through many online apps to buy their products. The fashion industry is transitioning into the new technological world. Small company owners confront a major issue when it comes to the digital transition of traditional methods of selling fashion items into digital marketing. This is because fashion firms must make changes to every part of their organizational culture.

* Sathyabama Institute of Science And Technology, Chennai

The strategies

The fashion industry uses

Every fashion sector requires an all-encompassing vision and selling tactics made to endure competition from other brands of trendy goods. Fashionable companies' use of digital marketing has changed significantly over the past few years, and it is crucial that businesses continue to adapt and develop in order to maintain the effectiveness of their previous marketing strategies.

The following are a few techniques that may be utilized to enhance digital marketing in the fashion industries:

Link up via websites

Customers' need to keep up with the latest trends has changed over the past several decades, and more and more buyers are choosing to make purchases online rather than in person. If clients don't already have one, this sort of plan entails getting one for them; this transitions from a fashion to a fashion E-Commerce.

A mobile world

Next, having a website alone won't automatically attract clients. So, we must engage in digital marketing to promote the fashion industry. For instance, using celebrities to promote fashion with deals and discounts, etc. This calls for having a responsive website that scales content appropriately for the screen it is displayed on. If these promotions are not done, your mobile consumers may have a poor user experience, which may discourage them from engaging with your businesses further. This can be very important for the sector because many consumers discover items they like while going about their daily lives, and if they find what you offer but can't load it on websites.

Participate in social media

One of the crucial and successful strategies for advertising fashion companies is social media. As a person, the business cannot entice individuals to utilize its services and develop a rapport with its clients. However, as the fashion sector, you should also use restricted channels like Instagram to showcase and advertise your goods. Additionally, combine the business with fixed platforms like Facebook, Instagram, etc., so that customers can see something they like while browsing the catalogue.

Marketing campaigns

One of the best tactics for the fashion business is campaigning, as influencers are the focus of social media campaigns. When an influencer shares anything like a promotion for a high school, both the influencer and their followers prefer children since they are persons within the industry/niche who have large fan bases and command attention. Children on the other side of the tracks idolize them and want to imitate them.

Change with the technology

Rapid technological developments throughout the industrial revolution, including those in artificial intelligence (AI). For instance, chat bots serve as 24/7 customer support agents that direct your consumers through the checkout process as soon as they arrive on your website. They are there to assist your users if they have any problems. And a personality's representative will take over if they lack the capacity to respond to that inquiry.

Review of literature

M. S. Nuryati and E. S. Bahri (2022) to identify Asnaf Entrepreneurs' digital marketing platforms and their techniques for advancement. They discovered that Asnaf entrepreneurs use Facebook, Path, Instagram, Twitter, Linked in, and other digital marketing sites.Google, Facebook Messenger, Line, BBM, Pinterest, We-chat, YouTube, Whats app, and Google. However, Asnaf Entrepreneurs have aided in the growth of the country. They therefore come to the conclusion that the transformation technique must be used on an associated current basis. **El-Sayed, A., and El-Fanagely, B. R. (2022),** In a paper titled "The relevance of digital lighting fashion technique in generating new fashion marketing," The research seeks to understand and put into practise the marketing concepts that are essential for generating excellent business outcomes in the fashion industry. They discovered that a wide variety of lighting and technological equipment, from small light emitting diodes to liquid crystal (LC) displays, from diode lasers to electro fluorescent radiators, are used in clothing design. The aesthetic, ergonomic, informational, and biological qualities are increased when such gadgets are included into contemporary clothing design. **Saura et al., 2019,** one of the causes of this transformation process was the so-called Bubble Point Com, which, along with the advancement of information and communication technologies,

created a speculative economic current on technologically based companies, startups, and online businesses. **Chaffey et al., 2003** stated the definition of the technique through which internet marketing will serve the marketing and corporate goals of the firms. According to this study's analysis of numerous marketing researchers, businesses do not necessarily need their own online marketing plans.

Methodology

For data collection and analysis, the research methodology used was descriptive research design. With a sample size of 250 consumers who purchase Fashion Accessories in Digital Marketing as targeted persons in Chennai city, the sampling approach used was Convenient Sampling Technique under Non – Probability Sampling. Primary data was collected using a questionnaire, while secondary data was collected through a review of literature, websites, books. The study's shortcomings include a small sample size of 250 respondents. The research employs a set of organized, predefined questions. It is a scientific investigation. The data s are depicted in the form of tables and charts and t test, Percentage method of analysis, ranking method of analysis is used for statistical analysis.

Objectives

- To assess consumer knowledge of internet advertising among those looking to buy fashion accessories in Chennai City.
- To look into the types of fashion accessories that consumers buy after using digital marketing.
- Researching the elements that influence the purchase of fashion accessories on various digital media channels.
- To make recommendations to improve the purchase of fashion accessories using digital marketing.

Data analysis

From Table & Chart 1, It implied that 60% of the respondents taken into account for the current study are female, between the ages of 21 and 40, and earn between Rs. 21,001 and Rs. 40,000 per month.

From Table & Chart 2, it revealed that for online fashion accessory buying, 39.2% of respondents choose Myntra, 26.4% prefer Flip kart, 20% prefer Amazon, 10.4% prefer Snapdeal, and 4% prefer Ebay. As a result, the vast majority of respondents in Chennai City chose Myntra for online accessory purchasing.

H0 = There is no significant difference between male and female with respect to the kinds of fashion accessories purchased by customers through Digital marketing.

H1 = There is a significant difference between male and female with respect to the kinds of fashion accessories purchased by customers through Digital marketing.

It is inferred from table, that all the null hypothesis are rejected as the p value is lesser than 0.001, so we accept alternate hypothesis. Hence, there is a significant difference between male and female with respect to the kinds of fashion accessories purchased by customers through Digital marketing.

Suggestions

1. Before selling their items online, business owners should understand how buyers feel about attractive accessories.
2. Customers anticipate special deals and discounts throughout holiday seasons in an effort to draw them in with inventive marketing tactics.
3. To increase their company's profit margin, business owners may still boost their marketing through adverts or other social media platforms.

Limitations of study

- For this study, only 250 respondents who are residents of Chennai were used to obtain the data.
- New models of purchase through social networks and based on the views of other customers might be identified using the data, which could be utilized to investigate new behaviour models of online users.

Conclusion

Because the buyer is allowed to pick from a wide range of rival brands, the fashion business is one of the riskier industries with a very short lifespan. Digital marketing

is highly valued in society nowadays since it allows individuals to change consumer fashion trends by being able to demonstrate, discuss, and remark on them. Then, when it comes to marketers, it has grown to be a huge danger to gaining new consumers as well as keeping the ones they already have. Relationship marketing is a component of digital marketing that supports attracting and retaining satisfied repeat consumers. The study's findings show that individuals are aware of digital channels. Customers often prefer using digital channels to purchase whatever items they are interested in, regardless of their educational background. Monthly income is not a major factor when deciding which products to purchase through digital marketing. Most individuals prefer to acquire things through digital channels, and the survey revealed that consumer intentions to use digital marketing to make purchases have increased. Future research on the impact of digital marketing on consumer purchasing decisions over a larger geographic region is possible, providing more precise data.

References

Basheer A.M. Al-alak., 2010, *Mobile marketing: examining the impact of trust, privacy concern and consumers' attitudes on intention to purchase*, "International Journal of Business Management".

Behr O., 2018, *Fashion 4.0-digital innovation in the fashion industry*, "Journal of Technology and Management", 2(1), 1-9.

Dr. Shalini Nath Tripathi, Er. Monika Mittal. *Investigating the impact of mobile marketing in the current Indian scenario and proposing customization as a solution*.

El-Sayed A., El-Fanagel B.R., 2022, *The importance of digital lightening fashion technique in creating innovative fashion marketing*, "International Design Journal", 12(1), 119-136.

Ioanăs E., Stoica I., 2014, *Social media and its impact on consumers behavior*, "International Journal of Economic Practices and Theories".

Nuryati M.S., Bahri E.S., 2022, *Optimizing Digital Marketing Platform for the Success of Asnaf Entrepreneurs*, "ITQAN: Journal of Islamic Economics, Management, and Finance", 1(1), 41-47.

Purwaningwulan M.M., Suryana A., Wahyudin U., Dida S.S., 2018, *The uniqueness of influencer marketing in the Indonesian Muslim fashion industry on digital marketing communication era*. In the International Conference on Business, Economic, Social Science and Humanities. Atlantis Press.

Fisnik Morina*, Durim Selmonaj*

The effect of interstate conflicts on joint-stock company investment

1. Introduction

In this chapter, we will pay attention to the impact of wars and other verbal and direct conflicts on the investments of joint-stock companies. As well as this, we will try to explain why there is hesitation about such an investment. A problem that is of great importance in this study is the identification of the reason for whether or not to invest in shares in such situations. Throughout our research, we will analyze situations that will be able to give us a true image, or, let's say, something close to being true.

According to Schneider & Tröger (2004), financial markets can also experience a „war rally" if traders believe that hostile events signal political determination to quickly end a confrontation and minimize the economic damage that war will inevitably cause. To better understand the stochastic nature of the stock market, Sun, Wang, and An (2022) state that ensemble learning is an effective way to increase model robustness in financial data.

The question of whether stock markets are efficient and whether prices reflect the expected profitability of firms remains open, according to Tease (1993). According to him, it is clear that simple models that assume constant expected returns do not explain the behavior of stock prices; it is not clear whether this is due to market inefficiencies that result in prices moving away from their equilibrium or whether it is because of the change in expected returns over time.

In the following, we will discuss: How interstate conflicts have affected equity investments. In which case we will use the scientific methods which will be the quan-

1 * University "Haxhi Zeka", Faculty of Business – Peja, Republic of Kosovo

titative (quantitative) methods applying the deductive, inductive, comparative, critical, observational and analytical approach. The data that will be used in the research are secondary and are based on economic theory. In order to obtain the necessary results from this work, namely to have the possibility of giving recommendations afterwards, we will use meta-analysis as a comparative method.

A company that has shareholders as owners is a joint-stock corporation. Shareholders purchase and sell stock and own a portion of the corporation. The total number of shares that each person owns determines their ownership percentage. Shareholders may purchase and sell shares, as well as transfer shares among themselves, without risking the company's ongoing existence. Joint-stock businesses enable a robust firm to emerge and flourish by bringing numerous people together. Each shareholder makes an investment in the firm and profits from it. Each shareholder owns a portion of the firm equal to the amount invested. In today's corporate law, joint-stock firms are frequently associated with limited liability companies (LLCs). What exactly does this mean? LLCs are private businesses. They are a kind of hybrid; they combine a tax--deferred partnership with all the benefits of a corporation. By means of this scientific paper, we will be able to present true and stable results regarding the relevant conclusions, which will serve as a reference point for young researchers in this field.

The hypothesis regarding conflicts of interest for an IS (Individual Stock) suggests that the first part is positive, while the second part is negative; that is, the IS of £ is the increase in buying activity before recommendations and the increase in selling activity after recommendations. (Shen & Chih, 2009). One reason, according to Laskai (2015), why he survived the last market crash is that he studied past market fluctuations, monitored economic fundamentals, and read Marx's Das Capital. The second reason was that the recent market crash had already wiped out all his savings. Some playfully contrasted China's mythicized past with financial market developments. Cartoons depicting ironically repurposed images of communist liberation circulated on social media. Studies argue that the underlying causes of the problems of the 1970s and those of the early 21st century (Levine, 2009) are similar: both periods were characterized by shifts in income and economic power from what had been the rich world to regions and new places.

2. Scientific Research Methodology

In this chapter, we will first carry out an empirical analysis of the impact of interstate conflicts on the level of equity investments, then continue with a comparative

analysis of the findings of different authors regarding this topic. The data that will be used in the research are secondary; that is, they are qualitative data.

The following research includes a different period and relevant cases that lead to a substantive conclusion. Thus, meta-analysis will be used as a method to evaluate the impact of interstate conflicts on the level of equity investments. This will be a comparative analysis of numerous studies, a breakdown of the views of different authors regarding the world of joint stock companies, their avoidance of difficult decisions, as well as the reasons that push the latter to make or not difficult decisions.

In addition to the meta-analysis, there will also be a critical look at the various points interpreted and commented on by the researchers. Through such work, we will be able to have a clear view of how different phenomena are having an impact, specifically in our case, the impact of interstate conflicts on the investments of joint stock companies.

3. Literature Review

However, regardless of the outcome of this paper, we will finally have a clearer view of how such a situation affects this phenomenon in stock investments. How does conflict affect economic growth in sub-Saharan Africa? (Fang, Kothari, Yenice, & McLoughlin, 2020). A simple comparison of the pace of economic growth in conflict and non-conflict situations suggests that real GDP growth is, on average, about 2.5 percentage points below where there is conflict, and growth is the lowest in cases of high intensity conflict. Therefore, Lintner (1965) mentions that, with respect to any arbitrarily chosen portfolio of stocks, the investor's expected net rate of return on his total net investment is linearly related to the risk of return on the total investment's net return, measured by the standard deviation of its return.

According to Guiso, Sapienza, and Zingales (2008), the decision to invest in stocks requires not only an assessment of the risk-return trade-off given the existing data but also an act of trust (courage) in the data we possess as reliable and in the overall system. Most of us will not enter a three-card street game even after observing many rounds (and thus obtaining an estimate of the "true" pay distribution). Stock market history offers many instances when average stock prices refused to keep pace with the business trend. The data suggests that there are two other forces that have often acted to prevent the stock market from being 100 percent logical about the trend of the business. An important factor that has caused the market to oppose the prevailing business movement has been the operation of opposite currents in the fields of money and credit (Hughes, 1956).

According to McIntyre (1973), subjects were only told that they would participate in an experiment regarding the use of accounting information in investment decisions and that not all subjects would receive the same information. Stock price movements (Froot & Ramadorai, 2008) explain them as being mainly driven by cash flow news, and there is unlikely to be a significant change in expected returns. At lower frequencies, however, there is considerable evidence that there is a time variation in expected returns. Because of the opaque nature of bank assets, supervisors provide information that helps the market price the bank's stock. The implementation of the risk-weighted capital requirement is expected to reduce bank risk-taking; it can also provide useful information on the market price of bank equity securities (Udegbunam, 2004).

Thus, Vakhshuri (2015) states that Iran can attract about 50 billion dollars of investment for its energy industry by offering repurchase contracts to international companies. However, this type of contract failed to preserve the investments and activities of international oil companies, such as Total and Eni, in the energy industry. The lack of interest in the return contract was further reinforced by international sanctions against Iran and the situation in Iraq in 2004 and 2005. Although we know that geographic distance should be a barrier to foreign direct investment, it may be that the reduction in the cost of international telecommunications and travel argues for a reduced role of geographic distance as an explanatory factor and a barrier to potential equity investment. (Grosse & Trevino, 1996).

Expected returns, according to (Redmond & Cubbage, 1988), for investments with higher levels of risk will be required to be greater than less risky investments, but at the expense of greater change in asset value over time. times. A measure of systematic risk and return that has been widely adopted in ex-post analysis in modern financial theory to assess the risk of financial investments is the Capital Asset Pricing Model (CAPM). In this model, risk is represented as the variance of the historical percentage changes in the value of an asset as a function of the variance of the percentage changes for an asset market index over time. Despite the focus that IS diffusion risk has received from conceptual and practitioner perspectives and the development of several typologies of offshoring risks, there is very little empirical work that has examined actual firm-level investment decisions in IS offshoring in the face of offshoring risk at the country level (Hahn, Doh, & Bunyaratavej, 2009).

War always has its consequences, and we can never say that it has the same epilogue. Thus, the last war in Ukraine (Sommer, 2022) thinks that it is turning out to be one that not a few companies have saved from its impact. In general, political instability and conflict can cause uncertainty in markets, which can lead to increased volatility and decreased investor confidence. This may result in stock price fluctuations and

affect the overall performance of the stock market. In the case of the Russia-Ukraine conflict, the impact on the stock markets of both countries has been mixed. During periods of heightened tensions or military activity, such as the annexation of Crimea in 2014 or the escalation of the conflict in eastern Ukraine, both the Russian and Ukrainian stock markets have experienced significant declines.

However, there have also been periods where markets have shown resilience in the face of geopolitical risk. For example, after the annexation of Crimea, the Russian stock market suffered a sharp decline but then recovered and even outperformed many other emerging market indices. It is important to note that the stock market is affected by a wide range of factors beyond just geopolitical events, including economic data, company performance, and investor sentiment. Therefore, according to Boungou & Yatié (2022) while the Russia-Ukraine conflict may have an impact on the stock markets of both countries, its effects may be complex and difficult to predict. The Russia--Ukraine crisis will slow global growth and increase inflation, as the risk to global growth is linked to the disruption of Russia's energy supply. Different companies that are listed on stock exchanges in these countries have different impacts from the conflict in Ukraine and Russia. For example, oil exporting companies in Russia may have been particularly affected by sanctions imposed by Western countries and by the conflict in Ukraine, as oil exports are an important source of Russia's income (Mallika, 2022).

On the other hand, Ukrainian companies that are involved in the energy and transportation industries may have a different impact, as the destabilization of the region may create challenges in planning and developing their operations. However, it is important to note that the impact of conflict on different stock markets can be very complex and depends on many factors, including the economy, the development of companies, and the impact of other political and economic events at the regional and international level.

4. Case Study: The War in Ukraine

EPAM Systems Inc. is a software engineering and IT consulting company headquartered in Newtown, Pennsylvania. The company operates globally, with a significant presence in Eastern Europe, including Ukraine. During the conflict, EPAM faced the challenge of ensuring the safety and security of their employees in Ukraine while also continuing to provide high-quality services to their clients. In response, EPAM put in place remote work policies, stepped up security at their locations, and provided assistance to affected employees and their families. Additionally, EPAM

leveraged their expertise in software engineering to develop new technologies to help mitigate the impact of the conflict, including systems to track aid distribution and real-time crisis monitoring tools.

Carnival Corp. is a Miami-based cruise line that operates across the globe, including Europe. Throughout the turmoil, Carnival encountered security and passenger and crew safety problems. The corporation reacted by increasing security on its ships and in its ports of call, as well as giving passengers frequent information on the situation in Ukraine. Carnival also utilized its resources to deliver humanitarian assistance to devastated regions and collaborated with local groups to help with relief operations.

PVH Corp. is a multinational clothing corporation that owns Calvin Klein and Tommy Hilfiger. PVH has a large presence in Ukraine, including production and retail operations there. During the crisis, PVH encountered supply chain interruptions and concerns about staff safety. The corporation reacted by introducing new logistical tactics to assure product delivery on time and by beefing up security at its sites. Additionally, PVH worked with neighborhood organizations to assist the affected communities and gave financial aid to employees who had a direct impact on the violence.

Westinghouse Air Brake Technologies Corp., generally known as Wabtec, is a worldwide transportation technology firm that offers rail and transit equipment and services. During the crisis, Wabtec encountered supply chain interruptions as well as concerns about the safety of its personnel and facilities in Ukraine. In response, the corporation implemented new logistical techniques and increased security measures at its locations. Wabtec also used its transportation technology experience to create new goods and services to help relief operations, such as systems to monitor transportation infrastructure and track the flow of supplies.

5. Conclusion and Recommendations

In conclusion, the companies mentioned in the text faced significant challenges during the conflict in Ukraine, ranging from ensuring the safety of their employees and customers to managing supply chain disruptions. However, each company responded to the challenges in its own way, using its expertise and resources to mitigate the impact of the conflict and provide support to affected communities. EPAM Systems Inc. introduced remote work practices and created new technology to assist in the monitoring and tracking of relief delivery, while Carnival Corp. improved security and delivered humanitarian supplies. PVH Corp. established new logistical tactics to assure product delivery on schedule and gave financial support to impacted workers.

Finally, to help relief efforts, Westinghouse Air Brake Technology Corp. adopted new logistical tactics, strengthened security measures, and improved transportation technology. Overall, the actions of these organizations highlight the need for adaptation and creativity during times of crisis.

Based on the actions of EPAM Systems Inc., Carnival Corp., PVH Corp., and Westinghouse Air Brake Technologies Corp. during the Ukraine crisis, it is clear that businesses must have contingency plans in place to deal with unanticipated obstacles. These businesses reacted by using their skills and resources to lessen the effects of the war and give assistance to impacted areas. Companies operating in volatile locations or sectors should consequently have contingency plans in place to safeguard the safety and security of their workers, customers, and facilities. These preparations should include measures such as remote work rules, enhanced security measures, frequent updates to stakeholders, and collaborations with local groups to aid with relief efforts. Furthermore, businesses can use their experience and resources to create new technologies and products to help in relief operations and aid distribution. Companies that have these strategies in place may lessen the effect of unanticipated obstacles while also supporting the communities in which they operate.

References

Boungou W., Yatié A., 2022, *The impact of the Ukraine–Russia war on world stock market returns*, "Economics Letters".

Fang X., Kothari S., Yenice M., McLoughlin C., 2020, *The Economic Consequences of Conflict in Sub-Saharan Africa*, "IMF Working Papers" 20(221), pp. 25-38.

Froot K.A., Ramadorai T., 2008, *Institutional Portfolio Flows and International Investments*, "The Review of Financial Studies", 937-971.

Grosse R., Trevino L.J., 1996, *Foreign Direct Investment in the United States: An Analysis by Country of Origin*, "Journal of International Business Studies", 139-155.

Guiso L., Sapienza P., Zingales L., 2008, *Trusting the Stock Market*. Wiley, 2557-2600.

Hahn E.D., Doh J.P., Bunyaratavej K., 2009, *The Evolution of Risk in Information Systems Offshoring: The Impact of Home Country Risk, Firm Learning, and Competitive Dynamics. Management Information Systems Research Center*, University of Minnesota, 597-616.

Hughes J.F., 1956, *The Stock Market, Bank Investments and the Federal Reserve*, "The Analysts Journal", 23-26.

Laskai L., 2015, *Pollution*, ANU Press.

Levine R.A., 2009, *Adjusting to Global Economic Change*, RAND Corporation.

Lintner J., 1965, *The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets*, The MIT Press, 13-37.

Mallika M., 2022, *The Russia-Ukraine Conflict Is Rattling the Stock Market. Here's What Investors Should Do Now*, https://money.com/russia-ukraine-stock-market/

McIntyre E.V., 1973, *Current-Cost Financial Statements and Common-Stock Investments Decisions*, "The Accounting Review", 575-585.

Redmond C.H., Cubbage F.W., 1988, *Portfolio Risk and Returns from Timber Asset Investments*, University of Wisconsin Press, 325-337.

Schneider G., Tröger V., 2004, *The winners and losers of war: stock market effects of armed conflict, 1990-2000. War and the World Economy: The Impact of Political Conflicton*, Stock Markets.

Sommer J., 2022, *More Trouble for a Troubled Market*, https://www.nytimes.com/2022/02/23/business/stock-market-correction.html

Sun S., Wang R., An B., 2022, *Quantitative Stock Investment by Routing Uncertainty-Aware Trading Experts: A Multi-Task Learning Approach*. Nanyang Technological University.

Shen C.-H., Chih H.-L., 2009, *Conflicts of Interest in the Stock Recommendations of Investment Banks and Their Determinants*, "The Journal of Financial and Quantitative Analysis", 1149-1171.

Tease W., 1993, *The Stock Market and Investment*, "OECD Economic Studies", No. 20.

Udegbunam R.I., 2004, *Asset Portfolio Composition, Size, and Bank Stock Risk: Evidence from Nigerian Commercial Banks*, "African Review of Money Finance and Banking", 5-30.

Vakhshouri S., 2015, *Iran's Energy Policy after the Nuclear Deal*, Atlantic Council.

Abstract

Purpose: The main purpose of this paper is to analyze the relationship that exists between interstate conflicts and investments in the shares of different joint stock companies by comparing the cases of different countries around the world. This study is focused on explaining the phenomenon of how wars and other verbal and direct conflicts affect the investments of joint-stock companies.

Methodology: The scientific methods that have been applied in this are the qualitative methods through the deductive, inductive, comparative, critical, observational, and analytical approaches. The data used in this study are secondary and are based on various electronic libraries and various research reports from relevant institutions in the investment field. In this study, the methods of meta-analysis, case studies, and critical analysis were applied.

Study Findings: According to the empirical findings of this study, we can conclude that an escalation of the political situation in a country will influence this political crisis to have

negative effects in the economic aspect as well, with various intrigues and sanctions that will affect negative investment trends in global corporate stocks.

Practical implications: This study provides theoretical and empirical evidence regarding the effects that interstate conflicts cause on the investments of joint stock companies. Despite the limitations that this research may have, it can serve as a good source of information for other researchers who will analyze the impact of various wars and conflicts on global corporate investments.

Originality: The paper contains data from reliable sources in the existing literature that show in a precise and consistent manner the effect of various interstate conflicts on the investments of joint stock companies.

Keywords: Conflicts, Investments, Joint Stock Companies, Sanctions.
JEL Codes: J6, R1, N4

Azemina Mashovic[1], Jovana Kisin[2], Jelena Ignjatović[3]

Comparative analysis of foreign direct investment in Serbia and North Macedonia

Introduction

Foreign direct investment (hereinafter FDI) is long-term, the international capital flow that directly impacts economic growth in key industries, employment, trade, developing trade links with the world, and technology transfer. The most important indirect effect is considered to build the institutional and legal framework necessary for the functioning of markets, but the readiness of the domestic economy to implement investment programs is essential (Adžić et al. 2015, p. 3). With its numerous beneficial effects on reducing unemployment (Filipović & Ignjatović, 2022, p. 89), increasing productivity, the competitiveness of the economy on the global market, and improvement of living standards, foreign direct investments are key for the economic development of any country. This type of investment can accelerate economic growth, providing access to new technology transfer management (Kisin et al. 2022) and production-oriented knowledge, while the corresponding policy of opening domestic markets to foreign competition can create a long-term basis for the great benefit of the investment (Krugman & Obstfeld 2009, p. 48). Foreign investments are of great

1 Associate professor, PhD, American University of Europe–FON, Faculty of Economics Sciences, Skopje, North Macedonia, email: mina.masovic@gmail.com

2 PhD Student, University Educons, Faculty of Business Economics, Sremska Kamenica, Serbia, email: jovana.kisin@educons.edu.rs

3 Corresponding author. Lecturer and Assistant professor, PhD, Academy of applied studies Šabac, Unit of Agricultural Business Studies and Tourism, Šabac, Serbia and International University, Brčko District, Bosnia and Herzegovina, email: jignjatovic985@gmail.com

importance for the economic growth of all countries, especially developing countries and countries in transition, which played a significant role in the structural changes of production and exports in countries that benefit from these funds (Terzić 2014, p. 7, Filipović et al. 2015). For the country, FDI means the creation of new jobs, an increase in exports, and, in general, the initiation of economic growth and development. On the other hand, as a form of foreign capital investment, they allow the investor to acquire the right of ownership, control, and management based on the invested capital (Stojanović 2020, p. 4).

The aim of this paper is to analyze the investment activity, changes, and dynamics of FDI in Serbia and North Macedonia, as two representatives of the Western Balkans. Comparative presentation of data gives an overview of the investment activity of selected countries. Special emphasis in this research is on the evaluation of the investment environment in the Western Balkan region. In addition to the introduction and conclusion, the paper consists of three parts. The first and second part refers to the investment trends, level, and structure of FDI inflows and outflows in Serbia and North Macedonia, while the third part relates to the assessment of the investment environment in the Western Balkan region with recommendations for improvement. In conclusion, final remarks are given. From a methodological point of view, this work presents a quantitative synthesis and analysis of data from representative databases of international institutions, with the aim of a detailed presentation and drawing conclusions about the subject of research. The research results contribute to the knowledge about this topic and the perception of several aspects of FDI in the Western Balkans countries, as an unavoidable factor of economic development.

1. Analysis of the foreign direct investment flows in Serbia

The process of liberalization of capital flows and the opening of the market enabled a sharp increase in investment in the form of FDI at the end of the 1970s, which was followed by the creation of many transnational companies (Filipović & Petrović, 2017, p. 16). The global investment trends of the last ten years are characterized by extremely variable dynamics, as a result of turbulent circumstances due to the global economic crisis (Adžić & Tošković, 2015, p. 237), the Covid Pandemic and the energy crisis. Such investment trends have strongly affected transition countries, causing a slowdown in economic progress. Serbia has an upward trend in FDI inflows, due to its favorable geographical position and transport infrastructure. It is a good starting point, while the promotion of the Serbian economy, its natural and human resour-

ces, and informing foreign investors about the conditions and possibilities of doing business in Serbia are the most important tasks to be realized (Toskovic et al. 2016, p. 23). There are many positive foreign investments in Serbia, where, in addition to low corporate taxes, the economy is booming and shows tendencies toward reforms.

Since 2000, Serbia has had a positive trend in the level of FDI inflows, which has slowed down twice to a dramatic drop, due to the consequences of the first and second waves of the global financial recession. However, after 2012, global FDI returned to growth, and FDI flows directed to Serbia have increased in recent years (Adžić et al. 2015, p. 283). Compared to other countries, Serbia is distinguished by the subsidies that investors receive from the state because the law from 2014 on investments equates foreign and domestic investors. The goal of the law itself is to attract foreign companies, while an important factor is the low price of energy because Serbia has one of the lowest prices for electricity and gas in Europe. One of the factors is the low cost of labor. Human capital is an important factor in the investment environment because compared to the rest of Europe, young people are flexible, educated, and with a good level of English. The Government of Serbia has adopted a number of measures to attract foreign capital through the allocation of subsidies to investors for new jobs (research and development, production, and services), and agreements have been signed with many countries in order to avoid double taxation. However, the lack of transparency and consistency in the application of the law, as well as corruption, are the main problems that the Government needs to solve in order to facilitate the attraction of FDI flows (Adžić, et al. 2015, p. 286). FDI in Serbia slightly and unexpectedly in 2022, the year of inflation, the energy crisis, and the war in Ukraine, exceeded the level of 2021 and reached a level between 4.3 – 4.4 billion euros. In the first nine months of 2022, FDI reached 2.8 billion euros, looking at the countries of origin of investments, while the level of FDI is 13.6% higher compared to the record year 2021 (Express, 2023). Looking at countries, by far the largest inflow of investments came from China (a little over one billion euros), followed by Great Britain (260.7), Germany (247.6), and Japan (200) million euros (NBS, 2023). A by-product in the amount of 185 million euros was realized from Cyprus, where often the origin of the company that invests through Cyprus is completely different, while the Investment is made through a company registered in this island country due to tax advantages (Danas, 2022). Most of the investment was in the processing industry in the amount of 1.3 billion euros, that is, in the production of tires and plastics (444 million euros) and the production of motor vehicles (294 million euros). In addition, investments were made in construction, trade, and car repair. The main reasons for the record level of investments in 2022 are macroeconomic stability, a favorable business climate, Serbia's agreements on

free trade with other countries, and the arrival of Russians and Ukrainians in Serbia due to the war in Ukraine (Đurđević 2023).

According to the data of the Development Agency of Serbia (2023), the inflow of FDI in the period 2010-2022. Recorded an upward trend of growth. The only exception is 2012 when the escalation of the world economic crisis led to a drop in FDI. The highest level of FDI was reached in 2022, due to the emigration and investment of a large number of Russians and Ukrainians in Serbian territory (Figure 1).

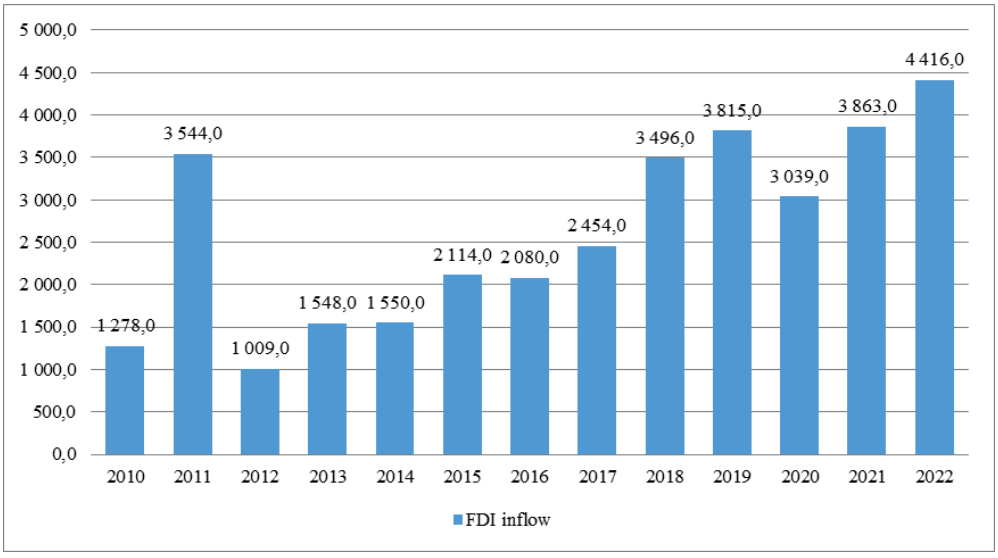


Figure 1. FDI trend of Serbia (million EUR), 2010-2022

Source: own work based on RAS…2023.

The share of FDI in GDP, both inflows and outflows, is a very important indicator due to its comparability. FDI inflow is considered high if the share of net inflow in GDP is more than 10% (Ađžić, Tošković, 2015). According to the World Bank data, Figure 2 presents FDI net-inflows (% of GDP) and FDI net-outflows (% of GDP) from 2010-2021. The figure shows that Serbia registered the largest FDI net inflow in 2011 in the amount of 10.0% of GDP. On the other hand, in terms of FDI net-outflows, in the analyzed period, Serbia registered the largest negative FDI net-outflows in 2015 in the amount of 0.9% of GDP.

Larger investments are necessary for achieving economic progress, a higher standard of living for citizens, and reducing unemployment, which is achieved by improving investment attractiveness and building a stable, competitive, and efficient busi-

ness environment that would encourage the attraction of FDI (Adžić et. al. 2015, p. 290). That is why it is primarily important to raise awareness that in the conditions of strong state interventionism it is necessary to preserve the entrepreneurial spirit, but above all freedom also for North Macedonia and Serbia (Ignjatović, et al. 2021, p. 14).

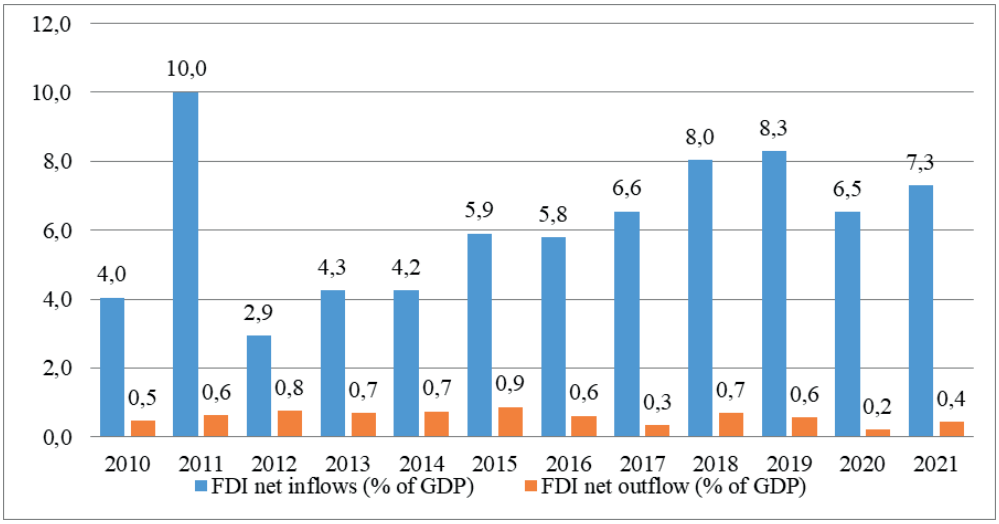


Figure 2. FDI net inflows (% of GDP) and FDI net outflow (% of GDP) of Serbia, 2010-2021.

Source: own work based on https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023] and https://data.worldbank.org/indicator/BM.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023].

2. Analysis of the foreign direct investment flows in North Macedonia

The global environment for international investment (Filipović & Ignjatović, 2021, p. 654) has deteriorated dramatically with the beginning of the war in Ukraine, which represents the culmination of all the negative impacts and challenges the world has faced during the pandemic crisis. The current global environment has caused the cost of living to rise dramatically for billions of people around the world, with the increase in energy and food prices contributing to lower real incomes and depreciating debt stress. Consequently, it has resulted in an enormous increase in uncertainty and risk in the investment environment worldwide. Regarding North Macedonia, FDI in the Macedonian economy represents one of the key financial flows that are directly involved in the financing of the current account. Despite the extremely uncertain

and turbulent global environment in the last few years, North Macedonia registered extremely favorable achievements in terms of foreign direct investments in 2022. Total net inflows in 2022 reached 670 million euros, or 5.2% of GDP, which represents an increase in FDI by almost 2 pp. of GDP compared to last year. According to the relevant data of the National Bank of the Republic of North Macedonia, most of the net inflows refer to intercompany borrowing (about two-thirds), and the rest is in the form of equity capital, which represents the non-debt component of direct investments, while the reinvested profit is negative. It is also important to note that certain positive structural changes have been registered, that is, a greater share of equity capital in total net inflows compared to the previous year. The increased FDI is in line with the growth of export activity, primarily in the automotive industry, but there is also interest in new investments in the economy (Latest...2023, p. 5).

Based on data from the National Bank of the Republic of North Macedonia, an analysis was made of the trend of FDI as a percentage of the gross domestic product (GDP) of North Macedonia in the period from 2010-2022. According to Figure 3, it can be stated that North Macedonia registered the largest amount of FDI in 2018 in the amount of 5.6% of GDP, which represents a record amount of FDI in the analyzed period. On the other hand, North Macedonia registered the lowest FDI in the analyzed period in 2020 the amount of 1.4% of GDP. The reasons for the record low amount of FDI in 2020 are mostly due to the global challenges related to the pandemic of the Covid-19 virus. After the record lowest FDI in 2020, foreign direct investments slightly increase in 2021 to 3.3% of GDP, and in 2022 a significant increase in FDI was registered in the amount of 5.2% of GDP, which represents the best result since 2018.

North Macedonia has the largest drop in foreign investments in the region in the pandemic year 2020 according to data published by the UN Conference on Trade and Development (UNCTAD), which represents an almost three-fold drop compared to 2019. North Macedonia had 224 million dollars in foreign investments, which is 38 percent less compared to the previous year. In the pandemic year, most investments were registered in Serbia – 3.4 billion US dollars, which is a decrease of one-fifth compared to 2019, followed by Albania with 1.1 billion dollars, which is a decrease of 14 percent compared to 2019. Of the other countries in the region, Montenegro registered 529 million dollars, which is 27 percent more than in 2019, then Bosnia and Herzegovina registered 371 million dollars, which represents a drop of 7 percent compared to the previous year (World…2021, p. 251). According to the World Bank data, Figure 4 presents FDI net-inflows (% of GDP) and FDI net-outflows (% of GDP) from 2010-2021. The figure shows that North Macedonia registered the largest FDI net-inflow in 2016 in the amount of 5.15% of GDP. On the other hand, in terms

of FDI net-outflows, in the analyzed period, North Macedonia registered the largest negative FDI net-outflows in 2014 in the amount of 1.76% of GDP.

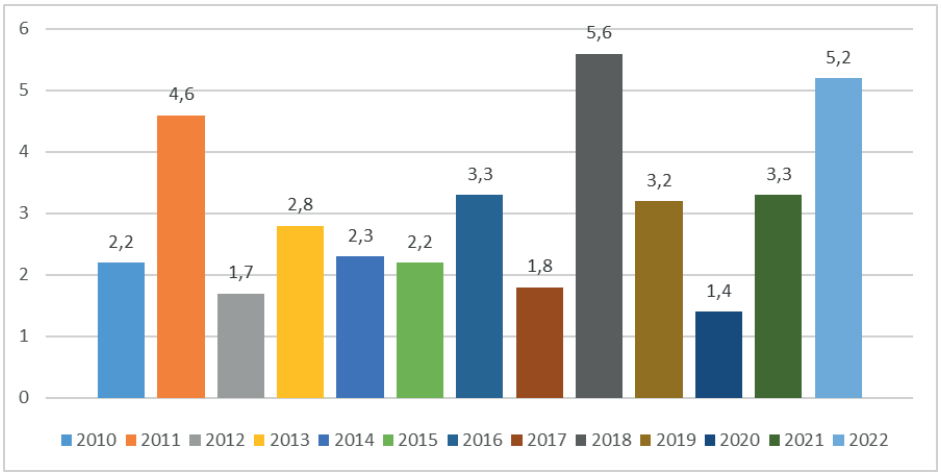


Figure 3. FDI trend of North Macedonia (% of GDP), 2010-2022

Source: own work based on Annual…2022, p. 19 and Annual…2021, p. 12.

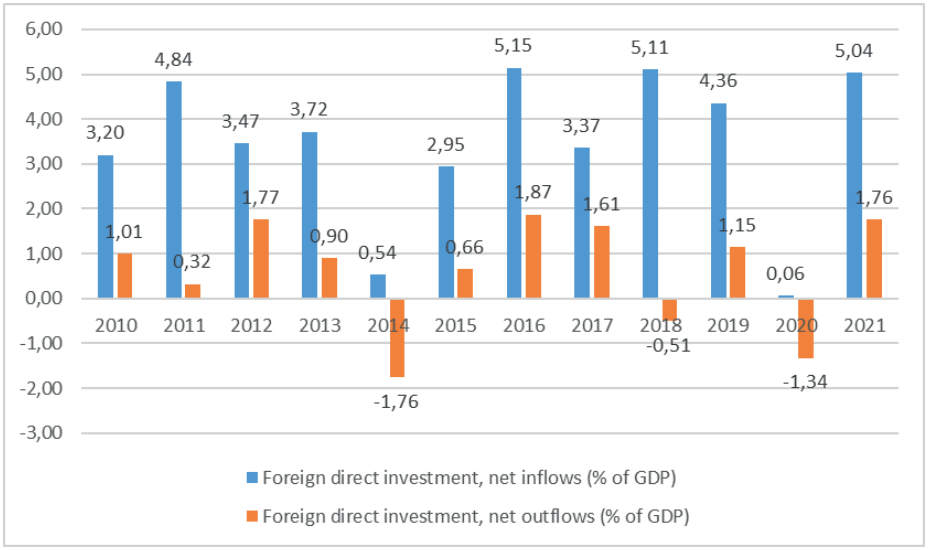


Figure 4. FDI net inflows (% of GDP) and FDI net outflow (% of GDP) of North Macedonia, 2010-2021

Source: own work based on https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023] and https://data.worldbank.org/indicator/BM.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023].

In order to get a more accurate picture of the impact of FDI on an economy, Figure 5 presents an analysis of the net inflows of FDI as a percentage of the GDP of the countries of the Western Balkans. Based on the World Bank's data on net inflow of FDI expressed as a percentage of GDP, they show that in every year of the analyzed period from 2010-2021, North Macedonia registered lower net inflows of FDI than the average of the countries in the region. In 2021 it achieved a net FDI inflow (% of GDP) of 5%, which represents a higher average only than Bosnia and Herzegovina. Montenegro registered a large net inflow of FDI in 2021, i.e. 12% of GDP.

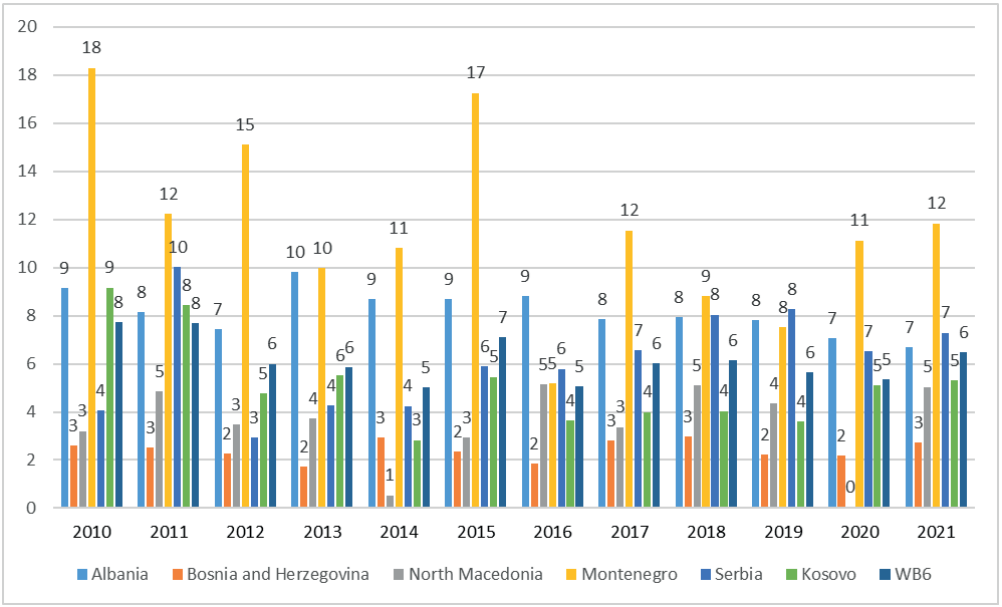


Figure 5. FDI net inflows (% of GDP) of Western Balkans countries, 2010-2021

Source: own work based on https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023].

Based on all the above, it can be concluded that total foreign direct investments (FDI) in North Macedonia have a low share in the country's gross domestic product compared to the countries in the region. The reasons for this situation are numerous, among which the most significant are the political situation, as well as the pronounced competitiveness between the countries of the region. The increased participation of FDI in the region of the Western Balkans is inversely proportional to the participation of North Macedonia in those investments. The indicator is the lower registered net FDI inflows (% of GDP) of North Macedonia in relation to the average of the countries of the region.

3. Assessment of the business and investment environment in the Western Balkans region

Factors to attract investment are different, from the structural characteristics of a country as one of the main characteristics to attract FDI, to those related to the characteristics of the labor market, demographic or educational factors. Although they have absorbed a significant amount of FDI since the beginning of the transition process (Filipović & Ignjatović, 2023, p. 695) and transition to a market economy, the Western Balkans still should improve their investment by implementing more economic, administrative, and legal reforms, and developing the infrastructure network. FDI inflows in the first place, raise the level of investment and overall economic activity in a country or region. The analysis (Stojanović 2020, p. 36) indicates that, due to the lack of domestic savings and difficulties with foreign borrowing, foreign direct investments were the most represented source of financing economic and economic development in the countries of Southeast Europe (which includes all the countries of the Western Balkans), which include Western Balkans. At the same time, FDI flows had an unfavorable structure, which resulted in low rates of economic growth. In the period 2009-2018. In 2010, the countries of Southeast Europe had an average economic growth rate of about 1.63%. (Stojanović 2020, p. 37). Especially in the current crisis period, economic growth should not be based only on foreign investments, because many other opportunities are open that can contribute significantly.

There are different multi-criterion approaches to measure the competitiveness of the investment environment. These approaches define and systematize the list of specific factors that includes almost all the economic (structural and market) factors, which have an influence on the ability for FDI attraction and the decision of foreign investors to invest in a particular country. (Tosković et al. 2016b, p. 43). Several international organizations developed assessment tools to measure countries' competitiveness. In terms of the performance of the implementation of reforms, European Bank for Reconstruction and Development on an annual basis monitors the progress of countries in transition by publishing collective transition indicators. Between 2004 and 2020, the Global Competitiveness Report (GCR) was a yearly report published by the World Economic Forum, that ranked countries based on the Global Competitiveness Index (GCI). This methodology monitored the 12 pillars of competitiveness and their constituent elements:

1. Enabling Environment: Institutions, Infrastructure, ICT adoption, and Macroeconomic stability.
2. Human Capital: Health, Skills.

3. Markets: Product market, Labor market, financial system, market size
4. Innovation Ecosystem: Business dynamism, and Innovation capability

Global Competitiveness Index (GCI) was a highly comprehensive index, based on the theory of competitive advantage, that captures the microeconomic and macroeconomic foundations of national competitiveness, understood as the set of institutions, policies, and factors that determine the level of productivity. The Global Competitiveness Report, from its first edition, aimed to prompt policymakers beyond short-term growth and to aim for long-run prosperity. The last regular 2019 edition, covering 141 economies, and the countries in the Western Balkan region were evaluated as presented in the following table.

Table 1. The Global Competitiveness Index 4.0 2019, country rankings

Country	Albania	Bosnia and Herzegovina	Montenegro	North Macedonia	Serbia
Population (millions)	2.9	3.5	0.6	2.1	7.0
GDP per capita (US$)	5,288.9	5,674.4	8,651.7	6,100.2	7,243.4
10-year average annual GDP growth (%)	2.4	1.7	2.4	2.1	1.5
5-year average FDI inward flow (% GDP)	8.6	2.4	10.8	3.2	6.1
GCI points	57,6	54,7	60,8	57,3	60,9
GCI global rank	81	92	73	82	72

Source: own work based on https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenes Report2019.pdf [accessed: 11 May 2023].

As data shows, Western Balkan is placed in the second half of the rankings, from the 72nd position for Serbia, which is the best rank within the Western Balkan group, to the 92nd position for Bosnia and Hercegovina. If we take into consideration just 40 countries in Europe, Western Balkans have the worse score and rank from 34th to 40th. The last 2020 special edition of the Global Competitiveness Report is dedicated to elaborating on the priorities for recovery and revival and considering the building blocks of a transformation towards new economic systems that combine "productivity", "people" and "planet" targets. This report measured Transformation Readiness Performance, but Western Balkan countries we not included in this analysis (World… 2020b).

When it comes to investment conditions, the Western Balkans has its regional characteristics, due to common heritage, a similar economic situation, and the same process of transition and implementation of reforms through which it passes, but also because of

the influence of the EU economy on the region's economic situation. However, there are significant differences when it comes to the improvement of the business environment, and countries have distinguished themselves with their results, as evidenced by the large differences in position. In this context, another representative framework used to assess the investment environment is the well-known Doing Business ranking developed by the World Bank. The rankings are benchmarked and based on the average of each economy's ease of doing business scores for the 10 topics included in the aggregate ranking. Separately, the Western Balkan countries are ranked as staged in the following table.

Table 2. Western Balkans rank by Doing Business Report, 2015 vs. 2020.

Doing Business topics	Albania		Serbia		North Macedonia		Kosovo*		Montenegro		Bosnia and Herzegovina	
	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020
Ease of doing business rank (1-190)	68	82	91	44	30	17	75	54	36	50	107	90
Starting a Business	41	53	66	73	3	78	42	12	56	101	147	184
Dealing with Construction Permits	157	166	186	9	89	15	135	160	138	40	182	173
Getting Electricity	152	107	84	94	88	69	112	90	63	134	163	75
Registering Property	118	98	72	58	74	48	34	37	87	83	88	96
Getting Credit	36	48	52	67	35	25	23	15	4	15	36	67
Protecting Minority Investors	7	111	32	37	21	12	62	128	43	61	83	88
Paying Taxes	131	123	165	85	7	36	63	48	98	75	151	141
Trading across Borders	95	25	96	23	85	32	118	31	52	41	104	27
Enforcing Contracts	102	120	96	65	87	47	138	53	136	44	95	93
Resolving Insolvency	44	39	48	41	35	30	164	48	33	43	34	37

Source: own work based on https://archive.doingbusiness.org/en/doingbusiness [accessed: 11 May 2023].

Briefly described data from the table, from the last issue of the Doing Business 2020 report, it can be concluded that the Western Balkan countries were evaluated differently according to the survey. North Macedonia has the highest position in the Western Balkans. Looking 5-year change, Serbia achieved the best results, moving 47 places upwards. Not all Western Balkans have made progress, Albania, and Montenegro went back and lost their rank, which was better in 2015 compared to 2020. Within the group Europe and Central Asia that count 23 countries, Western Balkans have from the 3rd place for North Macedonia and 8th for Serbia, till 21st for Albania and 22nd for Bosnia and Herzegovina, which is almost the worst rank in this group (Doing… 2023).

The Western Balkans, besides their favorable geographical position, can offer a competitive business environment and cheap labor force. The main advantages for attracting FDI in the Western Balkans are: geographical proximity of the EU market, a relatively good business environment, a relatively stable macroeconomic environment, and economic growth, a stable and developed financial system, corporate tax rates ranging between 9% and 15% that are among the lowest in Europe, highly educated and skilled workforce, ensured protection of the rights of investors (Toskovic et al. 2016a, p. 22), large subsidies to foreign investors in some countries (for example Serbia) and contracts resulting in the Stabilization and Association Agreement, EU and other CEFTA bilateral trade agreements (Filipović & Ignjatović, 2023 p. 33).

Although the region upgraded transport infrastructure, macroeconomic position, simplification of administrative procedures, legal protection, and assistance for investors, further reforms in the Western Balkans are necessary, especially to build a strong institutional framework, strengthen the judicial system, and fight against organized crime and corruption.

Foreign investors have recognized the existing opportunities in the Western Balkans, and as a result, the fact that region achieves a significant influx of direct foreign investment, however, the prevailing opinion is that this is still modest and far below the real potential of the Western Balkans. Looking through objective indicators, before the pandemic, the region achieved continuous economic growth (a trend of 3.5 percent in 2019 and 3.8 percent in 2020). Nevertheless, the obilize stock of foreign direct investment per capita in the Western Balkans is less than half of the stock of foreign direct investment per capita of the European Union member states from Eastern Europe and is only one-seventh of the European average (Bregu 2023). To improve this result, it is necessary to have the maximum involvement of all relevant stakeholders to create an open, stimulating, and prosperous economic environment. Joint presentation and promotion on the regional level, its natural

and human resources, informing foreign investors about the conditions and opportunities of doing business in Western Balkan, as well as the partnership linking the economy, are the most important tasks to be carried out. Only a stable and strong economy, improving the business and investment environment, can bring higher living standards and economic growth and development for all (Adžić et al. 2015, p. 284). It is very important that the structure and volume of FDI are very important and develop an investment environment that will stimulate the attraction of certain types of investments that are desirable not only for the economy but also for general social development and improvement. In addition to investments in healthcare, science, education, transport, or energy infrastructure, foreign investments can and should be focused on people's well-being.

Well-being as a statistical and measurement agenda has become increasingly relevant with a growing number of countries using well-being metrics for decision--making and informing budgetary processes, and overall compass for policy. Knowing the characteristics of an economy of well-being and how economies of well-being can be built provides policymakers with a better understanding of the links between the drivers of well-being and economic growth. Measuring economic performance and societal progress with the "beyond GDP" concept is well-established, but time has shown that this is not enough. In May 2011 the OECD launched Better Life Initiative with two main pillars How's Life? Measuring Well-Being and Your Better Life Index. Thanks to the OECD initiative and work, in the last twenty years "multidimensional well-being" has become an agenda for research, measurement, and policy tool. Accepting its importance, the OECD developed instrument for measurement, the OECD framework for measuring Well-Being, and OECD countries have now developed dashboards of well-being indicators (OECD, 2020). It provides an analysis of several important channels through which economic growth and well-being support and reinforce one another, focusing on the multidimensional impact and policy areas that are essential both for well-being and economic growth: 1) Education and Skills; 2) Health Care; 3) Social Protection and Redistribution; and 4) Gender Equality. In this context, the economy of well-being can be defined as an economy (Llena-Nozal et al. 2019, p. 4):

1. That expands the *opportunities* available to people for upward social mobility and for improving their lives along the dimensions that matter most to them;
2. That ensures these opportunities translate into *well-being outcomes* for all segments of society, including those at the bottom of the distribution;
3. That reduces inequalities; and
4. That fosters environmental and social sustainability.

On the basis that „citizens' well-being drives economic prosperity, stability and resilience, and vice-versa, good macroeconomic outcomes allow to sustain well-being investments over time', this concept points to the high need for putting people at the midpoint of policy for economic growth. To build an economy of well-being (Ignjatović & Filipović, 2022, p. 102; Tošković & Filipović, 2017, p. 15), this policy must also be applied in the investment policy to stimulate and attract investments that encourage the development of this concept. Investing in people's well-being, such as expanding opportunities for access to high-quality education and health care, and promoting inclusive social protection systems that foster resilience and social mobility, will set the foundations for stronger and more sustainable long-term economic growth (Llena-Nozal et al. 2019, p. 6). Such investments need to translate into improved well-being outcomes for all segments of the population. This has significant implications for policy and a central place in economic decision-making because investments should be obligatory to take account of the links between well-being outcomes and long-term economic growth. In the development of an economy of well-being, governments have a very important role in different ways. Establishing effective public/private partnerships for promoting well-being and mobilizing private finance for social impact, investment can constitute an innovative way of meeting financing challenges (OECD, 2020).

Conclusion

In the global economy, FDI unequivocally represents the basic mechanism of globalization of the world economy and is one of the most important forms of international financing of economic development. The effects of foreign investments on the domestic economy are numerous, mostly positive and mutual, and the key evidence for this is the very dynamic growth of FDI in recent decades. The relevance of FDI for the long-term economic development of countries, especially in developing countries, cannot be disputed, but economic growth should not be based only on them, especially in current circumstances. Today, the global economy is facing numerous challenges, caused by the consequences of the pandemic, the war in Ukraine, the cost of living, and the energy crisis. As a consequence of dynamic changes in the international business environment, the multi-year crisis period, the fragility of the global economy, uncertain politics, and geopolitical risk, resulted in changes in FDI flows. Today the biggest economic challenge is extremely high inflation, a problem with no easy solutions. In order to restrain it, interest rates will have to rise further, which will

cause a reduction in consumption and economic activity, that is, fewer foreign direct investments and new projects.

FDI in Serbia unexpectedly exceeded the level of 2021 in 2022, the year of inflation, the energy crisis, and the war in Ukraine, and reached a level between 4.3 – 4.4 billion euros. Looking at countries, by far the largest inflow of investments came from China, Great Britain, Germany, and Japan. Most of the investments were made in the manufacturing industry, i.e. in the production of tires and plastics and the production of motor vehicles, followed by construction, trade, and car repair. The main reasons for the record level of investments in 2022 are macroeconomic stability, a favorable business climate, Serbia's agreements on free trade with other countries, and the arrival of Russians and Ukrainians in Serbia due to the war in Ukraine. Regarding North Macedonia, the FDI analysis showed that the country lags in terms of net FDI inflows compared to the average of the Western Balkan countries in all analyzed years, from 2010-2021. According to the available data from the World Bank, North Macedonia achieved a net FDI inflow of 5% of GDP in 2021, which is lower than the average of the countries in the region, and higher only than the result achieved by Bosnia and Herzegovina. In the analyzed period, North Macedonia achieved the highest net inflow of FDI (% of GDP) in 2016 in the amount of 5.15% of GDP, while the highest net outflow of FDI (% of GDP) was achieved in 2014 in the amount of 1.76 % of GDP. After the enormous drop in FDI in 2020, North Macedonia registers a renewed increase in FDI in 2022 amounting to 5.2% of GDP. Based on the conducted analysis, it can be concluded that the total foreign direct investments (FDI) in North Macedonia have a low share in the country's gross domestic product compared to the countries in the region. The reasons for this situation are numerous, among which the most significant are the political situation, as well as the pronounced competitiveness between the countries of the region.

It is expected that 2023 will be a difficult year for transition economies with a real decline in population standards and an increasingly certain recession in some of the most important EU economies, which will certainly cause a drop in the level of FDI in the Western Balkans region, a trend that will probably be present at least until 2025. When the region starts on the road to recovery, more extensive investments will be necessary to achieve economic progress, a higher standard of living for citizens, and reduce unemployment. This can be achieved by improving investment attractiveness and building a stable, competitive, and efficient business environment that would encourage attracting FDI to the Western Balkans region. The region of the Western Balkans should have a common proactive approach to improve the business climate and present it to the global business and investment community. The foundation and key activity must be integration, strong regional cooperation, and connection of mar-

kets, people, and capital. The regional economic space of the Western Balkans should gather and connect goods, services, investments, the business community, and people. The development of an open regional market and joint investment space, with mobile experts and free movement of human capital in the region, with mutual recognition of academic and professional qualifications, would certainly have positive effects on improving the investment climate, attracting long-term investments, and preventing the departure of young people. In addition to the above, economic policies and growth need to relate to people's well-being, and to build a more intelligent economic system, an economy focused on human health and happiness, an economy of well-being, and foreign investment focused on achieving this agenda.

References

Adžić J., Tošković J., 2015, *Analiza trenda kretanja stranih direktnih investicija u tranzicionim ekonomijama Zapadnog Balkana,* Poslovna ekonomija – časopis za poslovnu ekonomiju, preduzetništvo I finansije, Godina IX, Broj 2, Vol. XVII, Educons Univerzitet, Sremska Kamenica, s. 235-258, https://scindeks-clanci.ceon.rs/data/pdf/1820-6859/2015/1820--68591502235A.pdf.

Adžić J., Tošković J., Marković J., 2015, *Trend analysis of foreign direct investment flows in Serbia with special reference to the evaluation of the investment environment*, "Journal of Theoretical and Applied Economics, Asociatia Generala a Economistilor din Romania – AGER", International Finance and Banking Conference – FIBA 2015, vol. XXII, , Special issue, Bucharest, Romania, pp. 281-291, https://ideas.repec.org/a/agr/journl/vxxiiy2015ispecial(ii)p281-291.html [accessed: 11 May 2023].

Annual Report Year 2021…, 2021, National Bank of the Republic of North Macedonia, Skopje, https://www.nbrm.mk/content/D0%91.pdf [accessed: 11 May 2023].

Annual Report Year 2022…, 2022, National Bank of the Republic of North Macedonia, Skopje, https://www.nbrm.mk/content/%D0%93%D0%BE%D0%B4%D0%B8%D1%88%D0%B5%D0%BD_%D0%B8%D0%B7%D0%B2%D0%B5%D1%88%D1%82%D0%B0%D1%98-2022-%D0%9D%D0%91.pdf [accessed: 11 May 2023].

Bregu M., 2023, *Regional Cooperation Council*, https://www.rcc.int/download/docs/Final%20EN%20Int_SG%20regional%20cooperation%20March%202023_BS.pdf/321c5957878918216ad7cc01125e709f.pdf [accessed: 11 May 2023].

Filipovic S., Ignjatovic J., 2021, *International relations through the prism of the new technological division of power*, "Međunarodni problemi", vol. LXXIII – Br. 4: 637-666. DOI: https://doi.org/10.2298/MEDJP2104637F.

Filipovic S., Ignjatovic J., 2022, *The effects of Chinese population policy on the labour market*, "Stanovništvo" 61(1), 1-21. https://doi.org/10.2298/STNV220609003F.

Filipovic S., Ignjatovic J., 2023, *Efects of transition on the standard of living and social inequality*, "Sociological Review", vol. LVII (2): 692-717. doi: 10.5937/socpreg57-42030.

Filipović S., Ignjatović J., 2023, *Foreign trade commodity exchange between the countries of the former SFRJ*. "The Review of International Affairs", vol. LXXIV (1187): 31-58. DOI: https://doi.org/10.18485/iipe_ria.2023.74.1187.2.

Filipović S., Petrović P., 2015, *Pozicioniranje privrede u globalnom ekonomskom okruženju*, Beograd.

Filipović S., Raspopović N., Tošković J., 2015, *The impact of transitional reforms on the level of external debt in countries in transition*, "Industrija", vol. 43 (1), 175-191. https://scindeks-clanci.ceon.rs/data/pdf/0350-0373/2015/0350-03731501175F.pdf

Ignjatovic J., Filipovic S., 2022, *A critical review of the rise of the neoliberal concept in economic policy*, „Sociological Review", vol. LVI (1), 90-119. doi: 10.5937/socpreg56-35619

Ignjatović J., Kisin J., 2019, *Summarizing Decade behind us – Economic Development and Transitional Reforms in the Western Balkan Region, proceedings*, 8th International Scientific Conference on Climate Change, Economic Development, Environment and People – CCEDEP 2019, October 2019., Educons University, Novi Sad, Sremska Kamenica, Serbia, 2019. pp. 41-61.

Ignjatović J., Kisin J., Mashović A., 2021, *Economics aspects of the COVID-19 pandemic in the Western Balkan region, proceedings*, International Conference "Sustainable Economic Transformation in the Postpandemic Period", Faculty of Business Economics, Educons University, Sremska Kamenica, 2021.

Kisin J., Ignjatovic J., Vemic-Djurkovic J., 2022, *Corporate restructuring in the economy of turism sector: a case study of Air Serbia*, 6th International Thematic Monograph – Modern Management Tools and Economy of Tourism Sector in Present Era, pp. 315-331. DOI: https://doi.org/10.31410/tmt.2021-2022.315

Krugman P.R., Obstfeld M., 2009, Međunarodna ekonomija, Data Status, Beograd.

Latest macroeconomic indicators: Overview of the current situation…, 2023, National Bank of the Republic of North Macedonia, Skopje. https://www.nbrm.mk/content/MPI%20publikacii/Najnovi_makroekonomski_pokazateli_mart_2023.pdf [accessed: 10 May 2023].

Llena-Nozal A., Martin N., Murtin F., 2019, *The economy of well-being: Creating opportunities for people's well-being and economic growth*, OECD Statistics Working Papers, No. 2019/02, OECD Publishing, Paris, https://doi.org/10.1787/498e9bc7-en.

Narodna Banka Srbije, 2023, *Makroekonomska kretanja*, https://www.nbs.rs/export/sites/NBS_site/documents/finansijska-stabilnost/prezentacije/prezentacija_invest.pdf

OECD, 2020, How's Life? 2020: Measuring Well-being, OECD Publishing, Paris. https://doi.org/10.1787/9870c393-en.

Stojanović D., 2020*, Poslovna ekonomija – časopis za poslovnu ekonomiju, preduzetništvo i finansije*, Godina XIV, Broj 1 Educons Univerzitet, Sremska Kamenica, s. 34-51, https://educons.edu.rs/wp-content/uploads/2020/10/Poslovna-ekonomija-20201.pdf

Terzić D., 2014, *Značaj globalizacije i stranih direktnih investicija za Srbiju*, Poslovna ekonomija, Edukons Univerzitet, Godina VIII – br. 1, Sremska Kamenica.

Toskovic J., Adzic J., Popovic S., Markovic J., 2016a, *Comparative analysis of the investment environment in the economies of the Western Balkans*, Regional and Business Studies Journal", vol. 8, no 1, 15-27, Kaposvar University, Faculty of E"conomic Science, Kaposvar, Hungary, pp. 15-27, http://journal.ke.hu/rbs/index.php/rbs/article/view/181.

Toskovic J., Adzic J. Popovic S., Markovic J., 2016b, *Impact on globalisation trend of movement of external debt in the Western Balkans*, "Annals of Constantin Brancusi University of Targu Jiu", Special Issue, vol. I, Targu Jiu, Romania, pp. 41-47. http://www.utgjiu.ro/revista/ec/pdf/2016- Special%20ECOTREND%20Vol%202/09_JELENA%20TOSKOVIC.pdf.

Tošković J., Filipović, S., 2017, *Neoliberalni concept privrede u zemljama Zapadnog Balkana*, Beograd.

World Bank, 2014, Doing Business 2015: Going Beyond Efficiency. Washington, DC: World Bank. DOI: 10.1596/978-1-4648-0351-2, https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB15-Full-Report.pdf.

World Bank, 2020, Doing Business 2020. Washington, DC: World Bank. DOI:10.1596/978-1-4648-1440-2, https://openknowledge.worldbank.org/server/api/core/bitstreams/75ea67f9-4bcb-5766-ada6-6963a992d64c/content.

World Economic Forum, 2020a, The Global Competitiveness Report 2019, https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

World Economic Forum, 2020b, Global Competitiveness Report Special Edition 2020: How Countries are Performing on the Road to Recovery, https://www.weforum.org/reports/the-global-competitiveness-report-2020/

World Investment Report 2021: Investing in Sustainable Recovery...2021, United Nation Publication, New York. https://unctad.org/system/files/official-document/wir2021_en.pdf [accessed: 12 May 2023].

Internet sources

Danas, 2022, *Odakle je stiglo najviše stranih direktnih investicija u Srbiju?*, https://www.danas.rs/vesti/ekonomija/odakle-je-stiglo-najvise-stranih-direktnih-investicija-u-srbiju/

Doing Business, 2023, https://archive.doingbusiness.org/en/rankings?region=europe-and-central-asia [accessed: 10 May 2023].

Đurđević M., 2023, *Rekordne strane investicije u Srbiji u godini invazije na Ukrajinu*, https://www.slobodnaevropa.org/a/srbija-strane-investicije-rekord/32199065.html

Ekspres, 2023, *Ko sve ulaže u Srbiji i koliko, koje industrije su najdominantnije,* https://www.ekspres.net/biznis/strane-investicije-u-srbiji-2-2-2023

Počev od 2007. godine, Srbija je privukla preko 42 milijarde evra stranih direktnih investicija, Razvojna agencija Srbije (RAS) https://ras.gov.rs/uspesne-price [accessed: 12 May 2023].

https://data.worldbank.org/indicator/BX.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023].

https://data.worldbank.org/indicator/BM.KLT.DINV.WD.GD.ZS [accessed: 12 May 2023].

Comparative analysis of foreign direct investment in Serbia and North Macedonia

Summary: In recent decades, foreign direct investment has been gaining significant importance in the Western Balkans region. This paper analyzes foreign direct investment and the factors that influence their attraction, as well as the investment environment in the Western Balkans region, with a special focus on the Serbia and North Macedonia. Macroeconomic stability, a favorable business climate, Serbia's agreements on free trade with other countries, as well as the arrival of Russians and Ukrainians to Serbia due to the war in Ukraine, are cited as the main reasons for the record level of investments in Serbia in 2022. The European Union is still the leader in direct foreign investments in Serbia. On the other hand, North Macedonia lags in attracting foreign direct investments. North Macedonia registered the biggest drop in foreign investments in the region in the pandemic year 2020, which can be confirmed according to the data published by the UN Conference on Trade and Development. The paper consists of three separate parts. The first and second parts analyze foreign direct investment trends in the period 2010-2022 in the Republic of Serbia and North Macedonia. The third part of the paper analyzes opportunities for improving the investment environment of these countries and Western Balkan region, and possibilities to attract investments that will have positive effects on the well-being of people and communities. Finally, the concluding considerations of the authors are given. The applied methodology consists of several qualitative research techniques, such as analysis, syntheses, and comparative analyses.

Keywords: analysis, FDI, investment environment, Serbia, North Macedonia.

JEL: F21, O11, O52, I31

Tayyibe Erten*

Carbohydrates and their role in health and well-being

Introduction

Along with the increasing ratio of non-communicable diseases, diet and lifestyle have become more critical than in previous decades. According to Word Health Organisation (WHO), the death number increased from 31 million to 41 million between 2000-2019, with major death caused was cardiovascular diseases (CVD) (WHO, 2022). Moreover, obesity is a globally increasing trend for adults and children, which has boosted the risk of other diseases. Especially the increasing ratio of type 2 diabetes (T2D) led by obesity is another fast-growing problem in public health. Since the causes of this situation include environmental factors, lifestyle, activeness, human eating behaviour and especially dietary behaviour, the interest in diet and its health consequences gained increasable interest in the last three to four decades. Thus, the research on the consumption of foods and the effects of the dietary components has been increased, and the researcher focused on understanding the relationship between the food components and the development of the pathologies of non-communicable diseases (Clemente-Suárez et al., 2022)

One of the most mentioned and investigated dietary components is carbohydrates. Their importance on diet and obesity (and obesity-related health problems) has been the trending topic for research since they are mostly the main components of staple foods. Although their consumption was frequently announced with health issues and disease, they have many beneficial effects on health, such as preventing colon cancer,

* Department of Nutrition and Dietetics, Faculty of Health Science, Bayburt University

providing energy for the body, and maintaining mental health. Therefore, in this chapter, the importance of carbohydrates and their beneficial health effects will be discussed in the light of scientific data.

Carbohydrates

Carbohydrates are the most abundantly found organic compound in nature, and they undertake different roles in animal, plant, microalgae, marine and microbial tissues. From a nutritional perspective, they are the main energy source for the body to carry out our main physiological activities, and the authorities do not establish their minimum requirement. They are easily found in many food sources such as cereals, vegetables, fruits, legumes and their products, which are the primary nutrient of staple foods worldwide (Hardy et al., 2015).

Although their basic structures consist of hydrogen, carbon and oxygen, their chemical structure can be classified as monosaccharides, disaccharides, oligosaccharides and polysaccharides. However, they can mainly be divided into simple (e.g., glucose, galactose, lactose, sucrose) and complex (polysaccharides, e.g. starch, glycogen, cellulose) according to their chain lengths and polymerisation. This diversity enables them to use in many industrial, pharmaceutical and food applications. Furthermore, the type of bonds and polymer lengths determines the effect of digestion rate, absorption and the speed of glucose release in the bloodstream. For example, glucose can quickly be digested in the small intestine, raising blood sugar levels. In contrast, oligosaccharides cannot be digested in the small intestine but fermented by beneficial microorganisms in the colon (Ludwig et al., 2018).

Carbohydrates and health

Carbohydrates are one of the macronutrients that can form energy in the human body. Since carbohydrates are found in many products such as plant, animal and marine products, they are also the main component of the daily diet. This energy is produced by the process called 'glycolysis', which is a metabolic pathway for breaking down glucose to pyruvate. Owing to this process, two molecules of adenosine triphosphate (ATP) are produced by one glucose molecule. After that, the energy production continues with the degradation of pyruvate until carbon dioxide, water and 36 ATP are obtained. Carbohydrates also store in the human and animal body as glycogen in muscle and liver; thus, they are the body's first energy source when needed.

Furthermore, the stable and continuous glucose level in the blood is also essential for the brain, which uses glucose as the energy source to maintain its functions. The control of blood glucose level is regulated by insulin, glucagon, noradrenalin and adrenalin (Grosskopf & Simm, 2020). Since glucose rapidly digests and is absorbed after consumption, it can raise the blood glucose level very quickly than complex carbohydrates, which are metabolised slowly in the body. Therefore, people with diabetes should avoid simple carbohydrates and high starch-content foods such as bread, potatoes and high-sugar fruits, although they also have high amounts of dietary fibre (Hall, 2017).

Polysaccharides are the subgroup of carbohydrates and have been widely used as encapsulation agents and tissue engineering. Owing to their non-toxic, biodegradable, high availability, wide variety and distinctive physicochemical properties, they are preferred in cell and drug delivery applications. They can form a hydrogel by crosslinking via their ionic or covalent bonds; thereby, they can enclose high amounts of drugs or preserve the therapeutic substances. Xanthan gum, chitosan, guar gum, alginate, gum arabic, gellan gum and hyaluronic acids are the most common polysaccharides used for drug encapsulation (Das and Giri 2020).

Satiety is defined as a physiological state that inhibits food intake with feeling fullness. This situation continues until the next time the hunger signals occur in the body. This state is also essential for controlling food intake because when this physiological state changes into hunger, which initiates the eating process. Satiety is controlled by insulin and gut peptide hormones, including GLP-1, cholecystokinin (CCK), and PYY. However, long-term satiety is also affected by glucose, amino acid concentration in blood and the oxidation process in the liver, which is related to diet composition. For example, some of the diet components, such as proteins, require more time for digestion; therefore, releasing amino acids into the blood takes more time.

On the other hand, glucose or starch digest more rapidly than proteins; thus, the release of glucose to the bloodstream is quicker and needs lesser time (Amin & Mercer, 2016). Therefore, recent research indicated that the dietary components are related to satiety and hormonal control metabolisms (Neacsu et al., 2014; Bonnema et al., 2015; Kristensen et al., 2016; Klementova et al., 2019). In the case of carbohydrates and satiety, complex carbohydrates increase satiety since they can be digested more slowly than simple carbohydrates. Moreover, soluble carbohydrates or dietary fibre classified under non-starch polysaccharides can promote satiation and prolong satiety owing to viscosity enhancer properties, which may increase the exposure time in the oral cavity. Furthermore, the soluble fibre can form a gel in an acidic stomach environment, which induces stomach distension; thus, the stimulated afferent vagus system may activate the feeling of fullness. This gel formation also influences gastric emptying by

improving the mixture viscosity, thereby slowing down digestion and absorption of nutrients. Thus, pre- and post-absorptive satiety mechanisms are altered and stimulated by an extension of absorption time, which prolong the satiety. In addition to all of these, owing to this enhancing satiation ability, fibre rich diet is believed to impress weight management and obesity apart from improving well-being (Chambers et al., 2015). To achieve this purpose, pectin, beta-glucan, alginate, low-acyl gellan gum and guar gum were investigated by many researchers and their effects on satiation were observed via the explained mechanisms above and lowering the energy intake by suppressing the appetite (Wanders et al., 2014; Pentikäinen et al., 2014; Arshad et al., 2016; Bradbeer et al., 2015; Morell et al., 2014; Galali et al., 2021).

Dietary fiber and health

Dietary fibre is extensively defined as 'the edible parts of plants or analogous carbohydrates that are resistant to digestion and absorption in the human small intestine, which include polysaccharides, oligosaccharides, lignin, and associated plant substances' by the American Association of Cereal Chemists (ACCC) (AACC, 2001). According to this, dietary fibre term covers soluble and insoluble complex carbohydrates, and both of them are found in plant tissue. Therefore, they are taken into the human body by consumption of foods from plant sources since they include both insoluble dietary fibre (IDF) and soluble dietary fibre (SDF). Soluble fibres (pectins, gums, mucilages) are generally found in vegetables, legumes, and fruits, whereas insoluble fibres (hemicellulose, cellulose, lignin) are found in leaves, green and woody plants and cereals. Although IDF is not preferable for the food processing industry because it cannot dissolve in the water, they benefit health, especially for colon health. (An et al., 2022). Due to water binding and the good swelling ability of water, they increase the stool volume and stimulate intestinal peristaltic movement. Thus, the stool is quickly discarded, and the defecation problems such as constipation, haemorrhoids, and diverticulitis are prevented by promoting the regularity of laxation. Furthermore, facilitating intestinal motility in the colon reduces the faecal transit time; thus, the toxic material in the stool may cause less damage to gut mucosal cells. Hence, the risk of colorectal cancer can reduce by taking the carcinogens away with defecation (Arayici et al., 2022).

On the other hand, SDF can dissolve in water and generate gel formation; thereby, the viscosity enhances and the colonic transit time of digestive material decreases in addition to satiety effects. In addition to this, almost all of the SDF is entirely fermented in the colon by gut microorganisms and short-chain fatty acids (SCFAs), acetate,

butyrate, propionate, and gases (carbon dioxide, methane, hydrogen) are produced as a result of this fermentation (Pituch-Zdanowska et al., 2015). SCFAs can promote the growth and differentiation of beneficial microorganisms in the gut, prevent the growth of pathogens by increasing the pH, inhibit proinflammatory mediator activity and stimulate cancer cell apoptosis. In addition, one of the fermentation products reported recently is γ-amino butyric acid (GABA), an inhibitor neurotransmitter that lowers blood pressure potential in the body. Similar to IDF, SDF also has the potential to prevent some cancers, such as colorectal, ovarian, and breast cancer, by inhibiting or reduction of hormones secretion since SDF have the capability of decreasing the hormone and related enzyme concentration (Maphosa and Jideani 2016., He et al. 2022).

Another beneficial impact of SDF is taking part in the prevention/treatment of diabetes, which globally increases in the past few decades. SDF lowers blood glucose by glucose adsorbing ability, which blocks the connection of intestinal tissues. This effect generates by forming a network arrangement; hence, the glucose molecules are encapsulated in this physical barrier. According to research, SDF enhances glycaemic control (Fu et al., 2022) and lowers the post-prandial response of serum glucose and insulin response (Garcia et al., 2007; Reynolds et al., 2019).

Recent studies highlight the positive effect on CVD and lowering cholesterol by absorbing/chelating the excessive cholesterol in the stool. Furthermore, this lowering effect is provided by SCFA production in the gut since the low pH that is created through acidification diminishes the bile acids and increases the excessive bile removal from the body (Soliman, 2019; He et al., 2022).

Healthy carbohydrates and well-being

With the increasing prevalence of obesity and cardiometabolic syndromes in recent years, low carbohydrate diets that consist of high amounts of fat and protein (particularly animal sources) were suggested for the new diet model. These diets are efficient in the short term for weight loss and lessen energy intake; however, when the long-term effects were investigated, the risk of CVD and some cancer types were almost the same with a high carbohydrate diet (Sievenpiper, 2020). The studies about carbohydrate intake, metabolic syndrome observation and mortality rates also pointed out that the minimum risk was observed when the carbohydrate intake provides 50-55% of daily energy. These results highlight the importance of carbohydrate quality rather than quantity because the diet that included more dietary fibre was also healthier (Seidalmann et al., 2018; Dustin et al., 2023).

In light of the knowledge above, the term 'healthy carbohydrates' is defined; thus, plants and their carbohydrates have become more critical in the last three-four decades. Owing to not only their dietary fibre contents but also their bioactive chemical substituents, bioactive polysaccharides, polyols and resistant starch that can be found naturally in plants or as a result of food processing, adequate amounts of plant sources foods are recommended in the daily diet (Pituch-Zdanowska et al., 2015; Maphosa & Jideani, 2016). Particularly to emphasise the effect of a balanced and plant-including diet, the Mediterranean diet is suggested with evidence from many studies about its health benefits on many diseases and well-being such as diabetes, CVD, obesity, cancer and depression. Epidemiological studies presented a lower risk of these disorders thanks to its dietary components such as olive oil, fruits, vegetables and a moderate amount of food from animal sources (Nani et al., 2021).

On the other hand, the consumption of 'healthy carbohydrates' supports the evidence of the relationship between diet and mental health and physical health. White et al. showed that eating fruit and vegetables might boost emotional well-being (White et al., 2013). When the consumption of refined carbohydrates (sweet, chips) and healthy carbohydrates (fruit and vegetables) are compared, the group who consumed fruit and vegetables found that their creativity, curiosity and mental well-being were more significant than those that consumed refined carbohydrates. However, it is pointed out that this effect does not arise from only carbohydrates but also bioactive compounds/polysaccharides, vitamins and minerals within the fruits/vegetables (Conner et al., 2015).

REFERENCES

AACC (American Association of Cereal Chemists)., 2001, *The definition of dietary fibre*. Cereal Foods World, 46 (3).

Amin T., Mercer J.G., 2016, *Hunger and satiety mechanisms and their potential exploitation in the regulation of food intake*, Current obesity reports, 5.

An Y., Lu W., Li W., Pan L., Lu M., Cesarino I., Li. Z., Zeng W., 2022, *Dietary fiber in plant cell walls—the healthy carbohydrates*, "Food Quality and Safety", 6.

Arayici M.E., Mert-Ozupek N., Yalcin F., Basbinar Y., Ellidokuz H., 2022, *Soluble and insoluble dietary fiber consumption and colorectal cancer risk: a systematic review and meta-analysis*, "Nutrition and Cancer", 74(7).

Arshad M.U., Ishtiaq S., Anjum F.M., Saeed F., Chatha S.A.S., Imran A., 2016, *Acute effects of different dietary polysaccharides added in milk on food intake, postprandial appetite and glycemic responses in healthy young females*, International Journal of Food Sciences and "Nutrition", 67(6).

Bonnema A.L., Altschwager D., Thomas W., Slavin J.L., 2015, *The effects of a beef-based meal compared to a calorie matched bean-based meal on appetite and food intake*, "Journal of Food Science", 80(9).

Bradbeer J.F., Hancocks R., Spyropoulos F., Norton I.T., 2015, *Low acyl gellan gum fluid gel formation and their subsequent response with acid to impact on satiety*, "Food Hydrocolloids", 43.

Chambers L., McCrickerd K., Yeomans M.R., 2015, *Optimising foods for satiety*, "Trends in Food Science & Technology", 41(2).

Clemente-Suárez V.J., Mielgo-Ayuso J., Martín-Rodríguez A., Ramos-Campo D.J., Redondo-Flórez L., Tornero-Aguilera J.F., 2022, *The Burden of Carbohydrates in Health and Disease*, "Nutrients", *14*(18).

Conner T.S., Brookie K.L., Richardson A.C., Polak M.A., 2015, *On carrots and curiosity: Eating fruit and vegetables is associated with greater flourishing in daily life*, "British Journal of Health Psychology", 20(2).

Das M., Giri T.K., 2020, *Hydrogels based on gellan gum in cell delivery and drug delivery*, "Journal of Drug Delivery Science and Technology", 56.

Dustin D., Kowalski C., Salesses M., McDowell A., Kris-Etherton P.M., Belury M., Johnson L.K., Conrad Z., 2023, *Carbohydrate Intakes below Recommendations with a High Intake of Fat Are associated with Higher Prevalence of Metabolic Syndrome*, "Journal of the Academy of Nutrition and Dietetics".

Fu J., Xu K., Ni X., Li X., Zhu X., Xu W., 2022. *Habitual dietary fiber intake, fecal microbiota, and hemoglobin A1C level in chinese patients with Type 2 diabetes*, "Nutrients", 14(5).

Galali Y., Rees G., Kuri V., 2022, *The impact of waxy wheat flour, inulin and guar gum on postprandial glycaemic and satiety indices, sensory attributes and shelf life of tandoori and pita breads*, "Applied Sciences", 12(7).

Garcia A.L., Otto B., Reich S.C., Weickert M.O., Steiniger J., Machowetz A., Rudovich N.N., Möhlig M., Katz N., Speth M., Meuser F., Doerfer J., Zunft, H.J., Pfeiffer A.H., Koebnick C., 2007, *Arabinoxylan consumption decreases postprandial serum glucose, serum insulin and plasma total ghrelin response in subjects with impaired glucose tolerance*, "European Journal of Clinical Nutrition", 61(3).

Grosskopf A., Simm A., 2020, *Carbohydrates in nutrition: friend or foe?*, "Zeitschrift für Gerontologie und Geriatrie", 53(4).

Hall K.D., 2017, *A review of the carbohydrate–insulin model of obesity*, "European Journal of Clinical Nutrition", 71(3).

Hardy K., Brand-Miller J., Brown K.D., Thomas M.G., Copeland L., 2015, *The importance of dietary carbohydrate in human evolution*, "The Quarterly Review of Biology", 90(3).

He Y., Wang B., Wen L., Wang F., Yu H., Chen D., Su X., Zhang C., 2022, *Effects of dietary fiber on human health*, "Food Science and Human Wellness", 11(1).

Klementova M., Thieme L., Haluzik M., Pavlovicova R., Hill M., Pelikanova T., Kahleova H., 2019, *A plant-based meal increases gastrointestinal hormones and satiety more than an energy- and macronutrient-matched processed-meat meal in T2D, obese, and healthy men: a three-group randomized crossover study*, "Nutrients", 11(1).

Kristensen M.D., Bendsen N.T., Christensen S.M., Astrup A., Raben A., 2016, *Meals based on vegetable protein sources (beans and peas) are more satiating than meals based on animal protein sources (veal and pork)–a randomized cross-over meal test study*, "Food & Nutrition Research", 60(1).

Ludwig D.S., Hu F.B., Tappy L., Brand-Miller J., 2018, *Dietary carbohydrates: role of quality and quantity in chronic disease*, "British Medical Journal".

Maphosa Y., Jideani V.A., 2016, *Dietary fiber extraction for human nutrition—A review*, "Food Reviews International", 32(1).

Morell P., Fiszman S.M., Varela P., Hernando I., 2014, *Hydrocolloids for enhancing satiety: Relating oral digestion to rheology, structure and sensory perception*, "Food Hydrocolloids", 41.

Nani A., Murtaza B., Sayed Khan A., Khan N.A., Hichami A., 2021, *Antioxidant and anti-inflammatory potential of polyphenols contained in Mediterranean diet in obesity: Molecular mechanisms*, "Molecules", 26(4).

Neacsu M., Fyfe C., Horgan G., Johnstone A.M. 2014, Appetite *control and biomarkers of satiety with vegetarian (soy) and meat-based high-protein diets for weight loss in obese men: a randomized crossover trial*, "The American Journal of Clinical Nutrition", 100(2).

New Zealand Ministry of Health (NZMH), 2015, *New Zealand Food and Nutrition Guidelines,* Wellington, New Zealand: Ministry of Health.

Pentikäinen S., Karhunen L., Flander L., Katina K., Meynier A., Aymard P., Vinoy S., Poutanen K., 2014, *Enrichment of biscuits and juice with oat β-glucan enhances postprandial satiety,* "Appetite", 75.

Pituch-Zdanowska A., Banaszkiewicz A., Albrecht P., 2015, *The role of dietary fibre in inflammatory bowel disease*, "Gastroenterology Review/Przegląd Gastroenterologiczny", 10(3).

Public Health England (PHE), 2016, *Government Dietary Recommendations- Government recommendations for energy and nutrients for males and females aged 1 –18 years and 19+ years*, PHE publications. London, UK.

Republic of Türkiye Ministry of Health (RTMH), 2022, *Türkiye Beslenme Rehberi 2022*., Republic of Türkiye Ministry of Health, Ankara, Türkiye.

Reynolds A., Mann J., Cummings J., Winter N., Mete E., Te Morenga L., 2019, *Carbohydrate quality and human health: a series of systematic reviews and meta-analyses*, "The Lancet", 393(10170).

Seidelmann S.B., Claggett B., Cheng S., Henglin M., Shah A., Steffen L.M., Folsom A.R., Rimm E.B., Willet W.C., Solomon S.D., 2018, *Dietary carbohydrate intake and mortality: a prospective cohort study and meta-analysis*, "The Lancet Public Health", 3(9).

Sievenpiper J.L., 2020, *Low-carbohydrate diets and cardiometabolic health: the importance of carbohydrate quality over quantity*, "Nutrition Reviews", 78(Suppl 1).

Soliman G.A., 2019, *Dietary fiber, atherosclerosis, and cardiovascular disease*, "Nutrients", 11(5).

Wanders A.J., Feskens E.J., Jonathan M.C., Schols H.A., de Graaf C., Mars M., 2014, *Pectin is not pectin: a randomized trial on the effect of different physicochemical properties of dietary fiber on appetite and energy intake*, "Physiology & Behavior", 128.

White B.A., Horwath C.C., Conner T.S., 2013, *Many apples a day keep the blues away–Daily experiences of negative and positive affect and food consumption in young adults*, "British Journal of Health Psychology", 18(4).

World Health Organisation (WHO), 2022, World *Health Statistics 2022*, https://www.who.int/data/gho/publications/world-health-statistics [Accessed 7.06.2023].

SUMMARY

Carbohydrates are the main compound of the diet and are found in many foods of the daily diet. Although their consumption is necessary and beneficial for health and overall well-being, the consumption rate is the primary determinant of whether they are harmful or beneficial for the body. Since excessive consumption may lead to obesity and obesity-related/induced health problems, the consumption of carbohydrates should be optimal and contain both soluble and insoluble. When many dietary guidelines prepared by governments such as UK Government (PHE, 2016), Turkish Government (RTHME, 2022), New Zealand Government (NZMH, 2015) is examined, most of them suggest that 50-55 % of daily energy should be provided from carbohydrates. Therefore, the consumption rate, carbohydrate form (rapidly digestible, slowly digestible) and carbohydrate source are the main points that should be considered for their effect on well-being and health.

Keywords: Carbohydrates, obesity, dietary fibre, well-being

JEL Classification codes: I18

ABSTRACT

Carbohydrates are the main source of body energy, and their intake into the human body has different forms. They can mostly be consumed as complex carbohydrates in soluble and insoluble forms, which is claimed as a healthy way of eating them. Although their excessive consumption is related to obesity, their quality and quantity have become important recently. Since dietary fibre is also one of the carbohydrate forms, its positive health effects are proven

in many studies. Diets that include high amounts of dietary fibre help to increase weight loss owing to their soluble fibre content which can form a gel in the digestive system and, thus, it is slower digestion. The insoluble fibre is also associated with weight loss and colon cancer, which generates colon motion and accelerates the removal of toxic materials from the colon due to its high-water absorbance feature.

On the other hand, the content and characteristics of dietary fibre of many edible and non-edible plants were studied last decades regarding their potential health and food applications. However, apart from fibres, many studies showed that positive health effects result from fibres, bioactive compounds, and bioactive polysaccharides. Recent studies have also focused on fruit and vegetable polysaccharides since they have antioxidant, antidiabetic, anticancer and hypoglycaemic functions. Therefore, the consumption of fruit/vegetable supports health and well-being in their micronutrient contents and their fibre and bioactive polysaccharides.

Zamira Shabani[1], Donika Shkoza[2], Edona Haxhija[3]

Quality of life in patients with rheumatoid arthritis related to functional difficulty

1. Introduction

Rheumatoid arthritis is an autoimmune disease that causes chronic inflammation of the joints and other areas of the body, it is a chronic disease characterized by the onset and improvement of the disease. (William et al., 2019) The disease is often associated with reduced levels of physical activity and increased risk of co-morbidity and premature death, which lends weight to the importance of implementing a healthy life style. One prerequisite for early optimal care of patients with RA, including physiotherapy, is to survey attitudes, correlates and predictors related to physical activity and perceived health. Arthritis means inflammation in one or more joints. The disease is characterised by symmetric arthritis causing pain, swelling, stiffness and often fatigue and its course by periods of disease flare-ups and remissions.

The prognosis is difficult to predict in individual cases. Manifestations of inflammation in internal organs may occur in patients with relatively severe RA. The exact cause of RA is not yet known, but genetic and environmental factors contribute to the development of the disease (Klareskog et al., 2004). High levels of disease activity

1 University of Shkodra "Luigj Gurakuqi", Faculty of Natural Sciences, Department of Nursing, Shkodër, Albania. zamira.shabani@unishk.edu.al, ORCID: 0000-0001-8021-5391
2 University of Shkodra "Luigj Gurakuqi", Faculty of Natural Sciences, Department of Nursing, Shkodër, Albania. donika_shkoza@unishk.edu.al, ORCID: 0009-0001-7007-5791
3 University of Pristina "AAB College", Department of Nursing, Faculty of Nursing, Kosovo, Kosovë. edonahaxhijaa@gmail.com, ORCID: 0000-0002-9454-8485

(Chehata et al., 2001, Wallberg-Jonsson et al., 1999) are found to be a powerful predictor of premature death in RA.

The prevalence of RA in the population is 0.5-0.7%. The annual incidence of RA is 24/100 000 (Söderlin et al., 2002) with an incidence among women twice as high as that among men. The median age for disease onset is 55 years but RA may affect persons of all ages.

Disability, functional difficulty and general health perception RA is related to body structures, mainly the connective tissues in the musculoskeletal system, and body functions. As a result of the clinical progression activity limitations occur within a few years (Scott et al., 2005), and the increased risk of premature death tends to be associated with activity limitations (Wolfe et al., 2003). More activity difficulty are found in women with RA than in men and this is explained by lower grip force rather than by gender (Thyberg et al., 2005)

There is no known cure for RA and treatment will therefore be directed toward relieving symptoms and improving the progression of the disease. The goal of treatment is to decrease disease activity, prevent impairments, activity limitations and participation restrictions, and to achieve and maintain good general health perception. Early treatment of RA results in better outcomes (ACR 2002). The care and rehabilitation includes a customised combination of medication, surgery, patient education, physical activity and exercise, social and psychological counselling and joint protection.

2. Materials and Methodology

This is a descriptive cross-sectional study. The goal is to highlight the quality of life in patients with Rheumatoid Arthritis. Data collection was carried out in the period January – May 2019. The sample was selected randomly. 70 patients with rheumatoid arthritis were included in this study. Initially, we tried to include 100 patients, but for this period, so many patients were hospitalized. Patients with Rheumatoid Arthritis were given an international standardized questionnaire regarding the functional difficulty in performing daily activities. The questionnaire used contains 18 questions through which we obtain the necessary information regarding the level of difficulty in patients with Rheumatoid Arthritis.

Functional Status Index (Pilot Geriatric Arthritis Program, Alan M. Jette, 1978, Revised 1980). The Functional Status Index (FSI) was designed to assess the functional status of patients with rheumatoid arthritis. (Jette, 1978). Designed as both

a clinical tool and an evaluator, the scale measures the level of difficulty experienced in performing ADLs (Jette, 1980). Questionnaires with the patients were carried out at the "Mother Teresa" QSUT. Before starting the interview, the consent of the patient and family members was obtained.

The FSI was developed to evaluate a Geriatric Arthritis Pilot Program (PGAP) that sought to improve the quality of life of elderly patients with arthritis (Deniston et al., 1980). The goals of the program were to prevent disability, restore activity, reduce pain, and promote of social and emotional regulation (Jette, 1980).

The form should be completed in about 5 to 10 minutes. The FSI was found to have a sensitivity of 92% and a specificity of 89%. The validity and reliability of the tool have been supported through clinical practice and research.

To perform the statistical analysis, we used SPSS.Version.19 and Microsoft Office 2010. The Pearson correlation was applied for IC=99%, $p<0.01$.

3. Results and discussions

In this study, 70 patients with Rheumatoid Arthritis were interviewed in the Department of Rheumatology at Tirana University Hospital Center "Mother Teresa". Of these patients, 59 were women and 11 were men, from which it is clear that RA affects more women than men with a percentage of 84% in women and 16% in men.

Based on the study conducted on these patients, the average age of patients with Rheumatoid Arthritis is 55.2 years. Their minimum age is 24 years and the maximum age is 72 years, STDEV= ±8.6 years. In a distribution according to age groups, it turns out that 59% of these patients are aged 50-59 years, 26% of patients are aged 60-69 years, 11% are aged 20-49 years and only 4% of patients are ≥70 years old. As can be seen from the graph, it turns out that the most affected age group is 50-59 years old.

This study also shows that the region with the highest percentage of patients with Rheumatoid Arthritis is the region of Tirana with 45% of patients with Rheumatoid Arthritis, then comes the region of Durrës with 14%, followed by the region of Elbasan with 11%. In the city of Shkodra, it turns out that we have 8% of patients with Rheumatoid Arthritis, 6% in Fier and Lezhë, 3% in Kukës, Pogradec, Erseke, and the district with the lowest number of patients turns out to be the district of Gjirokastra.

At the Table 1, we can see that that 44% of patients with Rheumatoid Arthritis have very pronounced difficulty walking, 39% have pronounced difficulty, 10% of them have an average level of difficulty and only 7% of them have difficulty easy to walk. (see tab. No. 1)

To go up the ladder, 50% of patients with Rheumatoid Arthritis refer to having very pronounced difficulties, 34% of them have pronounced difficulties, 8% have an average level of difficulty, 7% refer to mild difficulties and only 1% of them have none at all. difficulty when climbing the stairs. To get up from the chair, 40% of patients have marked difficulty, 35% have very marked difficulty, 20% of these patients have an average level of difficulty and only 5% refer to having slight difficulty getting up from chair.

For patients with Rheumatoid Arthritis, it seems that the largest percentage of 40% have slight difficulties, 19% have marked difficulties, 18% have medium difficulties, 13% of them have no difficulties to write and only 10% have very pronounced difficulties. To open a container, it seems that in equal percentage 31% of patients have very pronounced difficulty and yes 31% have pronounced difficulty, 22% have an average level of difficulty, 10% have slight difficulty and 6% of these patients do not have no difficulty at all in opening a container.

To answer the cell phone 42% of patients with Rheumatoid Arthritis have slight difficulty, 30% have an average level of difficulty, 14% have no difficulty answering the cell phone, 10% have marked difficulty and only 4% of these patients refer to having very pronounced difficulties in answering the cell phone. In self-care, 49% of patients with Rheumatoid Arthritis report that they have marked difficulty in putting on pants, 21% have an average level of difficulty, 16% have very marked difficulty, 11% have slight difficulty and 3% have no difficulty at all. difficulty putting on pants.

To button a shirt 37% of patients with Rheumatoid Arthritis have an average level of difficulty, 36% have marked difficulty, 11% have slight difficulty, 9% have no difficulty buttoning a shirt and 7% have very difficult noted. From the obtained results, it can be seen that 43%, i.e. the majority of patients with Rheumatoid Arthritis have very pronounced difficulty in washing all parts of the body, 40% have pronounced difficulty, 11% have an average level of difficulty, 3% have a light level of difficulty and 3% have no difficulty at all in washing all parts of the body.

To put on a shirt or blouse, 43% of patients with Rheumatoid Arthritis have marked difficulty, 27% have medium difficulty, 19% have very marked difficulty, 7% have a slight level of difficulty and only 4% have no difficulty at all to wear a shirt or blouse. To sweep the carpet 79% of patients with Rheumatoid Arthritis have very marked difficulty, 11% have marked difficulty, 9% have an average level of difficulty and only 1% has mild difficulty. To reach the lower cabinets 67% of patients with Rheumatoid Arthritis have very marked difficulties, 24% have marked difficulties, 5% of them have slight difficulties, 4% have moderate difficulties and there is no patient with Rheumatoid Arthritis who it is not difficult to reach the lower cabinets. Rheumatoid arthritis seems to affect the daily life of patients and this is highlighted when a certain job needs

to be done. This is clearly seen in the difficulty that these patients have to wash clothes where 87% of them have very pronounced difficulty and 13% have pronounced difficulty. To clean the yard also 86% of patients have very pronounced difficulties, 13% of them have pronounced difficulties and only 1% refer to having an average level of difficulty. Even in exercising the profession, 70% of patients with Rheumatoid Arthritis have very pronounced difficulties, 16% have pronounced difficulties, 13% have an average level of difficulty and only 1% have slight difficulties in exercising the profession. To drive a car 51% of patients with Rheumatoid Arthritis have very marked difficulty, 23% have marked difficulty, 19% have an average level of difficulty, 6% of them have slight difficulty and only 1% of them have no difficulty at all to drive the car. From the results of the study, it can be seen that in order to participate in meetings, 38% of patients with Rheumatoid Arthritis have marked difficulties, 29% have very marked difficulties, 24% have an average level of difficulty, 6% of patients have slight difficulties and only 3% of them have no difficulty at all in attending meetings. To go out to visit friends 37% of patients with Rheumatoid Arthritis have marked difficulties, 29% have very marked difficulties, 24% have an average level of difficulty, 7% of these patients have slight difficulties and only 3% have no no difficulty at all in going out to meet friends. (see tab.1.)

Based on the study conducted on patients with Rheumatoid Arthritis, it results that 73% of them have a bad quality of life due to the difficulties they encounter in everyday life as a result of the disease, 17% have a very bad quality of life and 10% have a poor quality of life. life. Meanwhile we see that we have no patients with Rheumatoid Arthritis who have a good or very good quality of life. We see that RA significantly affects self-care, the marked difficulty these patients have in dressing, washing all parts of the body, washing clothes. Very pronounced difficulty is observed in everyday tasks such as sweeping the carpet, cleaning the yard, reaching low cabinets, and 70% of cases also have very pronounced difficulty in exercising the profession. These patients in 40% of cases have very pronounced difficulties to walk and 50% of cases to climb the stairs and this causes these patients to limit their activities such as work meetings or visits to friends. (see fig.1)

Based on the results of the conducted study, we see that in terms of the very bad quality of life and the very pronounced difficulties that accompany RA, women predominate by 20% compared to 0 cases for men. 91% of men have a bad quality of life with marked difficulty in performing daily activities compared to 69% for women.

We see that for the poor quality of life, i.e. with average difficulty, men and women have an almost equal percentage of difficulty, specifically 10% for women and 9% for men. (see fig.2)

From the results of the study, we see that the age group that has the most pronounced difficulty as a result of Rheumatoid Arthritis is the age group of 20-49 years old with 25% of the cases taken in the study.

Bad quality of life with marked difficulties is the largest percentage of the age group 60-69 years old with 83.3% of the cases taken in the study, followed by the age group 50-59 years old with 73.2%.

The average level of difficulty in living with RA and the ability to have a poor quality of life seems to be in the age group of ≥70 years with 33.3% of cases.

Meanwhile, we see that no patient in the study refers to having a good or very good quality of life. (see fig.3)

From the table 2 we note that we have a statistically weak relationship between age, gender and difficulty in performing daily activities. As a result, with increasing age, the level of quality of life decreases and the difficulty for basic activities increases, which reflects in the drop in points in total. From the Pearson correlation we have (r=-0.92, p=0.449).

Regarding gender, we notice the same thing, but the functional difficulty in women is greater, so they have greater dependence and it is referred to as a very bad quality of life. This is also seen in the FSI level. From Pearson's correlation we have (r=0.115, p=0.342).

4. Conclusions

Based on the data of the conducted study, it is noted that the largest percentage of patients with Rheumatoid Arthritis have very pronounced difficulties to walk, to climb the stairs, to take care of themselves. They have very pronounced difficulties to perform daily activities such as cleaning the yard, washing clothes, reaching low cabinets.73% of these patients have a poor quality of life due to difficulty in performing activities of daily living. They have very pronounced difficulties to exercise their profession and to drive a car. They have very pronounced difficulties to take care of themselves, to dress, to wash all parts of the body.The age group that has the most pronounced difficulty as a result of Rheumatoid Arthritis is the age group of 20-49 years old with 25% of the cases studied. Women predominate by 20% compared to men for very bad quality of life and very pronounced difficulties accompanying RA. The FSI for difficulty was 0.26, which correlates with foreign literature in studies done by different authors regarding the difficulty these patients have in daily life. We verify the alternative hypothesis that the quality of life in patients with

rheumatoid arthritis is related to age, that is, the older the age, the worse the quality of life. It is true that the quality of life is worse in women, but this is not statistically significant.

References

ACR, 2002, *Guidelines for the management of rheumatoid arthritis: 2002 Update*, Arthritis Rheum, vol. 46.

Chehata J.C., Hassell A.B., Clarke S.A., Mattey D.L., Jones M.A., Jones P.W., Dawes P.T., 2001, *Mortality in rheumatoid arthritis: relationship to single and composite measures of disease activity*, "Rheumatology", vol. 40.

Deniston O.L., Jette A., 1980, *A functional status assessment instrument: validation in an elderly population*, Health Serv Res, vol. 15.

Jette A.M., Deniston O.L., 1978, *Inter-observer reliability of a functional status assessment instrument*, J Chronic Dis., vol. 31.

Jette A.M., 1980, *Functional capacity evaluation: an empirical approach*, Arch Phys MedRehabil, vol. 61.

Jette A.M., 1980, *Health status indicators: their utility in chronic-disease evaluation research*, J Chronic Dis, vol. 33.

Klareskog L., Alfredsson L., Rantapaa-Dahlqvist S., Berglin E., Stolt P., Padyukov L., 2004, *What precedes development of rheumatoid arthritis?*, Ann Rheum Dis, vol. 63 Suppl 2:ii28-ii31.

Scott D.L., Smith C., Kingsley G., 2005, *What are the consequences of early rheumatoid arthritis for the individual?*, Best Pract Res Clin Rheumatol, vol. 19.

Shiel Jr, W.C., 2019, *Rheumatoid Arthritis (RA)*, https://www.medicinenet.com/rheumatoid_arthritis/article.htm.

Söderlin M.K., Börjesson N., Kautiainen H., Skogh T., Leirisalo-Repo M., 2002, *Annual incidence of inflammatory joint diseases in a population based study in southern Sweden*, Ann Rheum Dis, vol. 61.

Thyberg I., Hass U.A., Nordenskiöld U., Gerdle B., Skogh T., 2005. *Activity limitation in rheumatoid arthritis correlates with reduced grip force regardless of sex: the Swedish TIRA project*, Arthritis Rheum, vol. 53.

Wållberg-Jonsson S., Johansson H., Öhman M.L., Rantapää-Dahlqvist N., 1999, *Extent of inflammation predicts cardiovascular disease and overall mortality in seropositive rheumatoid arthritis. A retrospective cohort study from disease onset*, J Rheumatol, vol. 26.

Wolfe F., Michaud K., Gefeller O., . Choi H.K., 2003, *Predicting mortality in patients with rheumatoid arthritis*, Arthritis Rheum, vol. 48.

Summary

Abstract This is a transversal (cross-sectional) descriptive study. The aim of the study is to evaluate the quality of life of patients with Rheumatoid Arthritis. **Objectives:** To identify the level of functional difficulty related to daily activities in patients with RA according to gender and age groups. **Methodology**: The data collection was conducted in January-May 2019. The sample was randomly selected. In this study, there were 70 patients with RA. These patients were provided an internationally standardized questionnaire, administered by us. Measures the level of functional difficulty experienced by the patient in carrying out daily activities. Questionnaires with patients were conducted at "Mother Theresa" QSUT. Before the interview began, patient and family consensus was taken. To analyzed the statistical data was used the SPSS Version19 and Excel 2010. Was applied the Pearson Correlation for IC=99%, $p<0.01$. **Results**: The average age of patients is 55.2 years, the minimum age is 24 years, the maximum age is 72 years. In a distribution by age groups it turns out that 59% of these patients are aged 50-59 years old. From this study it is seen that the highest percentage of patients with RA is Tirana (45%). Based on the study conducted on patients with Rheumatoid Arthritis, it results that 73% of them have a bad quality of life due to the difficulties they encounter in everyday life as a result of the disease. Very pronounced difficulty is observed in everyday tasks such as sweeping the carpet, cleaning the yard, reaching low cabinets, and 70% of cases also have very pronounced difficulty in exercising the profession. Based on the results of the conducted study, we see that in terms of the very bad quality of life and the very pronounced difficulties that accompany RA, women predominate by 20% compared to 0 cases for men. From the results of the study, we see that the age group that has the most pronounced difficulty as a result of Rheumatoid Arthritis is the age group of 20-49 years old with 25% of the cases taken in the study .**Conclusions:** 73% of these patients have a bad quality of life due to difficulties in performing activities of daily living. The age group that has very pronounced difficulties as a result of rheumatoid arthritis is the age group of 20-49 years old with 25% of the cases studied. FSI for difficulty resulted 0.26.

Keywords: arthritis, functional difficulty, patient, quality of life, skill.

JEL classification: I1Health: **I120** Health Behavior, **I140** Health and Inequality, I310 Well-Being.

Madjid Salmi*

The hospital today: for what KIND OF evaluation?

Lesson Plan

I- The general functioning of the health establishment

- The importance of hospitality
- Evaluation of hotel aspects
- General services and logistics services
- Waste Management
- Evaluation of healthcare technologies
  - the impact of the development of these technologies on the state of health of individuals;
  - the diffusion of technologies will depend on the number of adopters, the lags in adoption and the intensity of adoption;
  - The impact on health costs;
  - problems related to the mastery of medical technologies;
  - dependence on the outside
- medical equipment
- Medical demographics

* Faculty of Economics, Commerce and Management Sciences Mouloud Mammeri University of Tizi-Ouzou

II- Structural elements of care

- Premises or buildings used for the accommodation of patients,
- The number of beds,
- The technical platform,
- medical and paramedical staff,
- The rate of medical and paramedical supervision per bed,
- The number of medical specialists,
- The existence of intensive care,
- External consultations
- The emergency department,
- The existence of an information system,
- The health and administrative organization,
- The existence of a formal mechanism for evaluating the quality of care, etc.

Introduction

The hospital was originally a philanthropic institution for the exclusive use of the poor in Europe. Indeed, the hospital at that time was a social system designed to reduce suffering, alleviate poverty, and even eliminate begging. There are no criteria for admission to the hospital: the needy and destitute go there to receive care. Quite often the vagabonds who come to the hospital pretend that they suffer from some infirmity and some incapacity in order to be accepted. Not knowing the origin of disasters, illness and death, the man of the Middle Ages implicated them with evil spirits and malefic forces. Also the way to cure disease is to fight these forces by magical and supernatural means. It is certain that medical care as we understand it today did not exist in the medieval hospital. Physicians are not an integral part of the system. The financing of the hospital is based on the public charity of Christians.

the hospitaltoday, is the center of enhancement of the functions of health systems. Illness is conceived as a biological dysfunction. Physicians represent the backbone of the hospital. They are, moreover, health expenditure authorisers. The financing of the hospital is based on collective mechanisms. The hospital's vocation is to receive patients (and only patients). The latter need to be well received, to be accommodated in better conditions, they must, moreover, benefit from better care services.

A small comparison between the medieval hospital and the contemporary hospital highlights the following changes:

For medieval hospital

- The disease is linked to all forms of spells
- The way to cure the disease is to fight these evil forces
- Funding for the hospital is based on Christian charity
- control of the church over the operation of the hospital

On the other hand, for the contemporary hospital

- Disease is a biological dysfunction
- The act of care is increasingly technical
- Hospital funding is socialized
- State intervention, social security, etc.

I- The general functioning of the care establishment

This operation is perceived either by a visitor; a full-time practicing physician; a patient staying in a hospital.

- **By an interested visitor:**
  - The external appearance of the establishment;
  - The clothing of staff;
  - A signaling which can be good or not at all successful;
  - Poor signage causing long wanderings
  - These wanderings will end up disturbing the staff working in the hospital
  - Especially when these wanderings favor intrusions into prohibited or reserved areas...

- **By a full-time physician:**
  - Satisfied or not with the conditions of exercise in the healthcare establishment to which he belongs

- **By a patient staying in a hospital**(the hospitalized patient is certainly inactive and generally anxious, but there remains a subject whose demand is significant in terms of attention):
  - A patient can remember for a long time the welcome he received on entering the enclosure of a hospital ward;
  - He remembers the waiting time for consultations;
  - the delay in visiting hours by the attending physician;
  - the friendliness and listening of the doctor or his negligence;
  - He will not forgive mediocre food;

- a poorly cleaned room;
- deafening noises;
- unavailable and less attentive staff.

The patient is called upon in the public health structures in Algeria to provide a financial contribution, he therefore considers himself to be a user of the healthcare system who clearly expresses requirements, whereas in the days of free healthcare these requirements were more buried and more discrete. The introduction of the fixed contribution for access to care which was decided in 1995 in public health structures in Algeria. Also, the purpose of the health system or its corollary the care system is to meet the needs of individuals (patients) and/or the entire population. The patient is at the heart of all the reforms undertaken.

- **The importance of hospitality**

Reception is of paramount importance for the patient. It is not limited to the first contact established between him and the institution able to support him. The importance of reception actually consists in limiting the patient's waiting time; it is also to look into the administrative aspects of hospitalization by taking care of the admission and discharge formalities of a patient. Also, the terms of his admission can be taken beforehand during his medical consultation. It also means examining on a more technical level all the possibilities offered in terms of additional examinations carried out on the patient. These can be rendered in their entirety to make a more exhaustive diagnosis. Just as it is inadmissible for a medical supervisor in charge of a care unit, to summon several patients for follow-up at the same time, on a date and at a fixed time, knowing that they cannot all be seen and examined at the same time. Taken from another angle, the importance of hospitality is:

- To create a service responsible for the reception and orientation of patients, their relatives and parents;
- It means listening to the patient;
- It means developing access and circuits within the hospital establishment;
- It means creating waiting areas;
- Of relaxation ;
- Parking areas for the vehicles of people accompanying patients evacuated to the hospital;
- Green spaces inside establishments for the comfort of patients and their families.
- Evaluation of hotel aspects

A modern hospital looks more and more like a comfortable hotel in its strictly hotel aspects. This is all the more true if we mask the technical and increasingly complex reality of a hospital. Assessing the quality of hotel aspects comes down to looking at:

- To comfort,
- to hygiene,
- At the restaurant
- To the safety of patients;
- This assessment can be made through detailed observation of day hospital premises,
- From the waiting room,
- Visitor toilets,
- Corridors which can be evaluated in relation to their width and their luminosity. Indeed, the central alignment of the lighting causes the glare of the patients lying on stretchers. On the other hand, lateral lighting would be more pleasant,
- Grab bars are necessary for moving tired patients,
- As well as the plates used to protect the walls to prevent their deterioration, when moving the patients, whether in their beds or in stretchers.

- **The room and the service where the patient is admitted, existing services within this same service**
  - In a patient's room, the observation can be made on the bedding as well as on the sanitary facilities and equipment,
  - Each room must be equipped with a sanitary and a separate bathroom,
  - The shower must be integrated into the floor in order to allow the passage of a wheelchair and above all to avoid unfortunate falls,
  - The toilet bowl must be fixed to the wall and not placed on the floor to facilitate cleaning,
  - Each patient must be able to have their own personal washbasin,
  - A shelf to put down your toiletries,
  - A separate cupboard where bowls and urinals will be stored to avoid the risk of material confusion between patients,
  - The furniture in the room must be ergonomic, i.e. it must be suitable for both the nursing staff and the patient,
  - An arrival of oxygen and suction per patient in each of the rooms is just as necessary,
  - Just as it would be necessary to install a large number of sockets to allow the connection of monitoring and assistance devices,

  - A possibility of calling to alert the nursing staff must be provided for each bed,
  - However, it would be very difficult to provide comfortable accommodation for a patient if the area of a twin-bedded room is less than twenty square meters and including the sanitary facilities, this area must be at least twenty-five square meters. There is even talk of 35 square meters as new room surface standards.

- **As far as the hygiene of the hotel industry is concerned, it must be rigorously analyzed because the safety of the patient depends on it.**
  - Personal hygiene is recommended, such as regular hand washing to avoid the transmission of bacteria and other viruses,
  - Clothing for the nursing staff is therefore required,
  - The cleaning and disinfection of the rooms must take place whenever necessary.

Simple and realistic recommendations can be issued to ensure hotel hygiene, for example:

- From the change of heavily contaminated outfits of the staff in charge of hygiene after a day spent cleaning the rooms, sanitary facilities or soiled equipment.
- In the event of infection, the attitudes of each other must be consistent in the sense that protective measures must knowingly be applied such as wearing a mask, gloves, a gown, a headdress for all staff. and especially the isolation of the sick.
- Indeed, infectious pathologies have implications in hotel matters such as:
  - Daily room cleaning,
  - Cleaning when the patient leaves,
  - Admission restrictions in the room where these pathologies exist,
  - Disinfection of premises or rooms…

However, insufficient training of staff and management can be costly for the establishment called upon to use large quantities of very expensive and even toxic products to eradicate the traces of infectious diseases, whereas economical, simple and often effective exist. Indeed, cleaning can be done effectively with very simple means:

- Use of mops or, failing that, disposable rags that are dipped in a bucket containing a diluted solution of disinfectant detergent for cleaning floor surfaces,
- Use of disposable gloves and aprons in special situations where the risk of soiling is high,
- Do not reuse soiled equipment,
- Special precautions must be taken in the treatment of dirty linen and waste according to their level of contamination.

- **General services and logistics services**

General services are represented by the catering, kitchen, dietetic kitchen, baby bottle, staff restaurant services, etc. On the other hand, the logistics services are represented by the supply services (hotel store, medical store , lingerie), central cleaning service, hotel and medical transport service, medical ecology service (waste treatment, etc.).

Activities related to general services and logistics services have financial consequences. The latter also reflect the level of functioning of the establishment, which can be good or bad. Indeed, these services are required to ensure the functioning of the kitchen, the supply of linen, technical security (electrical network, fire, etc.), management of solid and liquid waste, etc. It is therefore important to assess all these activities, especially in terms of the safety of the establishment, the staff and the patients staying in the various hospital departments.

Improperly treated laundry can be the cause of epidermal irritations favoring wounds which can lead to complications when these wounds are exposed to sources of contamination. A care establishment may, in certain cases, call upon the intervention of external service providers for the treatment of linen.

Fires can break out at any time in electrical networks, in installations with electrical spindles or of course in kitchens, which demonstrates that fire safety within establishments must be a priority. Detailed observation of daily practices can detect certain anomalies in terms of fire safety that should be corrected, such as the overuse of certain equipment. The safety requirement of healthcare establishments must inspire the legislator to adopt regulatory texts or observe safety rules drawn up under the supervision of specialized organisations.

The kitchen plays an important role in the patient's diet. It can be a source of satisfaction for users, but it also entails risks in terms of food safety, such as the poisonings that occur from time to time in a kitchen provided for an entire community, improving the preparation of dishes since these dishes are often rejected by patients. Prepared meals must meet two types of essential food controls:

– The dietary control carried out by specialists to balance and vary the menus thus intervening to avoid imbalances in the constitution of meals made according to local eating habits. This control can also intervene in the most severe cases of refeeding of patients after major surgery;
– Bacteriological control assumes that the general services are organized by sectors of activity, that is to say that the passages from one sector of activity to another are made according to the so-called „forward march" principle. which means that clean and dirty circuits must never cross.

- **Waste Management**

The care activity involves releases or considerable masses of waste. a large part of this waste is potentially dangerous due to being infected by bacteria and viruses. Waste management is considered an important activity for the healthcare facility. When the establishment is forced to take responsibility for the destruction of its waste, very significant financial costs ensue. The elimination of this waste represents all the steps relating to: the sorting of this waste which consists in differentiating at the source and as close as possible to the act or activity of care the different types of waste, namely:

- Waste from healthcare activities similar to household waste (DAOM),
- Waste from health care activities with infectious risks (DASRI),
- Toxic or radioactive waste which presents infectious, chemical, toxic and radioactive risks,
- This sorting must be carried out by setting up means of recovery, such as plastic bags with different colors chosen according to the nature of the waste:
  - Black colored plastic bags can be used for DAOM;
  - And the yellow color can be used for DASRI;
  - Spicy and sharp waste such as syringes and other sharp objects must be disposed of in specific boxes;

- **Evaluation of healthcare technologies**

The improvement in the state of health of the populations is mainly due to the existence of health structures in sufficient number; a wide distribution of care which has led to a better state of health; to the improvement of living, hygienic, working and food conditions. This improvement is, moreover, the result of technological innovation which is the essential factor of medical progress; the development of drugs, vaccinations, medical technologies such as medical imaging, which makes it possible to visualize the different parts and organs of the human body are concrete examples of the progress of human beings in taking charge of their state of health. However, these medical technologies remain expensive because they are the source of the inflation of health expenditure, even dangerous in the sense that medical actions present risks, such as the iatrogenic pathology which is developing. The notion of medical technology assessment appeared in the United States of America at the beginning of the last century. Indeed, it was in 1902 that the American Congress required the intervention of the federal government to guarantee the safety of all biological products sold on the American market through the "virus serum and toxins act", a procedure which was reinforced in 1938. then in 1982 regarding the effectiveness of such products. In 1976, a prior authorization for placing medical devices on the market was instituted. A year after the American

Congress founded the Office of Technology Assessment (OTA), which is responsible for making recommendations, in other words to carry out the evaluation with regard to new medical technologies and other fields of human activity. OTA defines technological evaluation as being "an approach whose object is to examine the consequences, in the short and long term, of the use of a particular technology on individuals and on society as a whole. It takes into account the safety, the experimental and pragmatic effectiveness of a technology, its cost and its cost/benefit ratio: it also includes the analysis of its economic, social and ethical implications and updates the points to be further investigated in terms of research directions". This process includes four steps: The OTA defines technology assessment as "an approach whose purpose is to examine the consequences, in the short and long term, of the use of a particular technology on individuals and on society as a whole. It takes into account the safety, the experimental and pragmatic effectiveness of a technology, its cost and its cost/benefit ratio: it also includes the analysis of its economic, social and ethical implications and updates the points to be further investigated in terms of research directions". This process includes four steps: The OTA defines technology assessment as "an approach whose purpose is to examine the consequences, in the short and long term, of the use of a particular technology on individuals and on society as a whole. It takes into account the safety, the experimental and pragmatic effectiveness of a technology, its cost and its cost/benefit ratio: it also includes the analysis of its economic, social and ethical implications and updates the points to be further investigated in terms of research directions". This process includes four steps: the experimental and pragmatic effectiveness of a technology, its cost and its cost/benefit ratio: it also includes the analysis of its economic, social and ethical implications and updates the points to be further explored in terms of research directions". This process includes four steps: the experimental and pragmatic effectiveness of a technology, its cost and its cost/benefit ratio: it also includes the analysis of its economic, social and ethical implications and updates the points to be further explored in terms of research directions". This process includes four steps:

- The first of which consists first of all in analyzing the technical performance of medical technology, namely its degree of precision, its reliability, its safety, its anatomical, physiological, biochemical effects, etc.
- In the second stage, it is a question of evaluating the effectiveness of this technology in other words to see if the latter presents risks for the health of individuals during its use and especially to establish its benefits.
- The third step will be the opportunity to make an estimate of the efficiency of this technology or to consider the effects of the technology in terms of cost--effectiveness, cost-benefit and cost-utility.

- Finally, the last step in this process is to assess the acceptability of medical technology by society and the legal aspects related to its large-scale distribution.
- It should be noted that these different stages of the process follow each other in a logical order, but the results of the evaluation are required in each of the stages before moving on to another higher stage because it would be inappropriate to continue an evaluation when the previous results are unimpressive.

The evaluation of healthcare technologies for the receiving countries, therefore countries which are closely dependent for the integration and the diffusion of these technologies on the producing countries, the appreciation of this process of integration-diffusion can therefore be analyzed on several levels:

- **the impact of the development of these technologies on the state of health of individuals:**it is necessary to make a distinction between technologies which prevent or cure specific diseases such as penicillin, the various vaccines whose impact is positive, technologies which do not cure diseases but which help in rapid diagnosis and the treatment of illnesses, such as medical imaging, the impact of which is nuanced because these technologies do not really improve the chances of rapid diagnosis given the high downtimes characterizing medical equipment or as a result of a lack of shots essential for their operation.
- **Diffusion of technologies**will depend on the number of adopters, the delays in adoption and the intensity of adoption. Indeed, the dissemination of major technologies are widely disseminated to the point where the use of vaccines has been generalized in Algeria, thus reaching a vaccination coverage rate of around 98%, while the use of medical imaging, being qualified as intermediate technology, has remained the prerogative of the large hospital services, which amounts to saying that it is the heavy diseases and the services belonging to the large hospitals which use these types of technologies and derive more advantages than the light care structures supposed to manage minor illnesses. As for the delay in the adoption of these technologies, this can be attributed to their cost and their mastery.
- **The impact on healthcare costs:**these medical technologies generate additional costs for health due to the fact that they are imported because the prices linked to their acquisition are first established by the producers, added to this these technologies operate by using various intermediate products, for example films and developing products which are in turn imported. Consequently, the producers have the possibility of playing on the prices by sometimes lowering the price of the equipment by catching up on the prices of the intermediate products or vice versa.

- **problems related to the mastery of medical technologies:**the use of medical technologies undoubtedly makes it possible to provide high-tech care, but raises problems with regard to their operation, their upkeep and finally their maintenance. Indeed, the proper functioning of these technologies requires maintenance, preventive and curative maintenance, otherwise this equipment will break down. The problems of upkeep and maintenance of this equipment mainly arise in the medium term, after a certain period of use following overuse of this equipment, lack of spare parts, lack of technicians or downright lack of preventive and curative maintenance.
- **Dependence on the outside:**the dependence on producers is doubly felt both in terms of the acquisition of these technologies and in terms of their operation. That said, this dependence generates heavy expenditure in foreign currency that the national economy cannot support without the other sectors of economic and social life being penalized.

- **medical equipment**

The resolution on health adopted by the central committee of the national liberation front (FLN)[2]in 1980 resulted in recommendations to equip each hospital with an adequate technical platform. Indeed, a special program for equipping hospitals has been drawn up. A financial envelope has also been released for this purpose for the realization of this program spread over a period of three years from 1981 to 1983. Thus, a large number of radiology equipment are imported as well as the importation of high-end means of investigation such as scanners.

Medical equipment includes medical imaging equipment, for example

- Mobile or fixed radio devices,
- dental radios,
- ultrasound machines,
- scintigraphy devices,
- Whole body scanners
- And head scans.

Anesthesia and intensive care equipment includes:

- Devices used for anesthesia and those of anesthesia evaporator,
- Respirators, medical-surgical aspirators, cardiac defibrillators which are devices used to stop cardiac fibrillation by means of an electric shock,

2 Single party at the time.

- Incubators to receive premature babies and warm them to an ambient temperature of 32°,
- Newborn resuscitation tables
- And finally surveillance monitors.

There is also equipment used for operating techniques or surgical operations.

- Such as scialytics,
- The operating tables
- And dental chairs.

Examples of equipment used for sterilization and disinfection

- Sterile air generators,
- Autoclaves using moist heat for the sterilization of gloves, compresses and incinerators.

Finally, there is equipment used for functional exploration such as

- EEG electroencephalograms,
- ECG electrocardiograms,
- EMG electromyograms,
- fiberscope endoscopes,
- Rectoscope endoscopes
- And endoscopes cystoscopes.

The standard medical equipment and materials that the different sectors of a hospital or an extra-hospital structure must have are determined by the nomenclature established at the level of the health services department. The latter includes hospital and extra-hospital medical equipment and materials assigned according to a list spread over twenty-one hospital functions as follows:

- Small care and examination equipment,
- Medical imaging,
- Functional exploration and monitoring,
- Laboratory,
- Anesthesia resuscitation,
- Surgical techniques,
- Functional Support,
- Therapy and functional rehabilitation,
- Disinfection -sterilization -waste treatment,
- Pharmacy

- Pet Shop,
- Accommodation and medico-surgical furniture,
- Furnishing Furniture,
- Office supplies,
- Audiovisual and telecommunications,
- Computer science,
- Workshop -gardens -fire -garages, heating – refrigerator -air conditioning,
- Kitchen – catering – food distribution,
- Laundry – lingerie,
- Cleaning and maintenance
- And finally transport and signalling.

Medical equipment needs rigorous technical-economic management and an appropriate maintenance policy. Indeed, preventive maintenance can be less expensive than curative maintenance because our dependence on spare parts is so strong that any breakdown is conditioned by a forced recourse to foreign suppliers for their delivery or failing that to an immobilization. of the device.

The failures that characterize[3]medical equipment are largely due to

- Deficiencies in maintenance,
- Lack of spare parts,
- To the wrong purchase,
- The unreliability of the devices,
- Overuse of certain equipment
- And finally, the non-renewal of equipment after having been used for a long time and at sometimes frantic paces despite the regime of the devices which requires moderation in their use.

- **Human resources in the health sector in Algeria**

Healthcare activity remains dependent on the massive use of personnel[4]. This remains essentially a service activity despite the sophistication of the equipment used in the production of care. Indeed, in its care production factors, there is a predominance of personnel. A significant part of this staff is qualified or even highly qualified, such as general practitioners and specialists.

3 Out of a total number of medical equipment equal to 21,498 in 2002 covering the needs of all the health entities of the country, 3,577 are broken down, representing a percentage immobilization rate of 16.63%.

4 More than 177,000 people work in the health sector in Algeria.

This sector is the third provider of jobs, after the national education sector and that of the interior and local authorities, it employs many staff and some of them have a special status such as the medical and paramedical professions. The statuses are very diverse since the medical and paramedical professions each have different statuses. The competent authorities are, moreover, different since the administrators are expenditure authorisers, whereas the doctors are also so when the latter prescribe treatments for their patients. The hierarchy at the level of a hospital is not always clear since if we take the paramedical corps, we find that the latter depends on the doctors on the occasion of the acts of care but also depends on the administrators as regards the treatment received. Consequently, this diversity of training followed, specializations and statuses gives rise to difficulties in communication and participation.

In the light of the foregoing, one is tempted to say that there are in fact two "devices" in the hospital capable of directing a single institution:

- The first of these devices is of a technical nature embodied by medical specialists, general practitioners and paramedics whose training courses are all oriented towards healing techniques and the best ways to bring comfort to the sick.
- While there is another bureaucratic apparatus embodied by the administrators who try to best „manage" everything which in reality is a matter of simple administration because they do not have a large margin of maneuver as regards management. more flexible and intrinsic to the establishment.

The personal service of a care establishment in Algeria is called upon to administer the bulk of the personnel working there. It is, moreover, the service in charge of managing professional careers because different bodies of staff in activity access after training or seniority to higher levels of qualifications so there is advancement and professional reclassification which should be managed wisely. He is also called upon to manage various situations for all these categories of personnel, namely: recruitment, remuneration, training, promotion, sanction, interruptions and end of career. All of these tasks may seem, at first glance, many and heavy consequences for the same service which most often restricts itself to a strict application of the texts to carry out these numerous missions. The legal aspect is often restrictive because all aspects related to personnel management are governed by texts. This is a main reason to consider and apprehend the management of health personnel in Algeria as being a personnel administration. Also, would the strict application of legal texts for the administration of this personnel be able to replace a real personnel policy emanating from the endogenous management of the health structure? a main reason to consider and apprehend the management of health personnel in Algeria as being a personnel administration. Also,

would the strict application of legal texts for the administration of this personnel be able to replace a real personnel policy emanating from the endogenous management of the health structure? a main reason to consider and apprehend the management of health personnel in Algeria as being a personnel administration. Also, would the strict application of legal texts for the administration of this personnel be able to replace a real personnel policy emanating from the endogenous management of the health structure?

Medical density[5]national can be calculated by summing the number of medical professions between the public sector and that of the private of all the health entities that the country contains then by reporting this number on the Algerian population which we multiply on 1000 this gives us the density following: x doctors per 1000 inhabitants. Similarly, it is possible to calculate other national densities[6]for pharmacists; dental surgeons etc.

5 For 2010, the medical density is of the order:
- General medicine: 1 general practitioner /1384 ha
- Specialized Medicine: 1 medical specialist/ for 2088 ha.

6 Out of a total workforce of 177,209 employees in the public health sector in Algeria, all bodies combined:
- the medical staff has a number of 28,111 personnel, i.e. a percentage of 15.86%,
- paramedical staff represents 48.54% with a total workforce of 86,021,
- dental surgeons with a number equal to 4,629, thus representing a percentage of 2.6%,
- 0.09% is the percentage of pharmacists,
- 0.2% of teachers working in university hospitals and EHS,
- 0.07% of docents, the lowest percentage of medical personnel,
- 0.78% of assistant professors
- and finally 2.85% of residents working like docents and assistant professors in CHUs and EHSs alone.
- The workforce of the administrative, technical and service corps represents 32.84% of all staff employed in the public sector.
- There are other personnel, such as educators, optometrists, speech therapists, paramedical teachers and psychologists working in the country's health entities, who themselves number 703, i.e. in percentage a rate of 0.39%.
- Added to this the number of staff in the health and population directorates (DSP) with a number of 2,085 all bodies combined (medical, paramedical, administrative, technical and service) or a percentage of 1.17%.
- As for the private sector, it totals a workforce of 20,143 employees, that is to say in percentage a rate of 11.36%, exceeding for certain corps of personnel the public sector. Indeed, there are 5,216 medical specialists, exceeding the public sector by 718 doctors, while the number of pharmacists in the private sector is twenty-eight times greater than that of the public sector.

The inventory of medical demography in Algeria. Thus this poses a great problem to those in power since in 1962 at the country's independence, there were just 342 doctors. In 1974, this number climbed to 1425 doctors while in 1990, this number is about 19487 doctors and in 2008 Algeria has 45000 doctors. Thus, 3,500 doctors are placed on the labor market each year. What characterizes this medical demography, on the other hand, is above all its very unequal geographical distribution. This is dense in university towns and economic centers, less dense in rural areas and suburbs, rare in the south considered a medical desert. There is therefore in Algeria a problem of distribution of doctors than a deficit of practitioners.

II- Structural elements of care

These can be summarized in the assessment of the following points, among others:

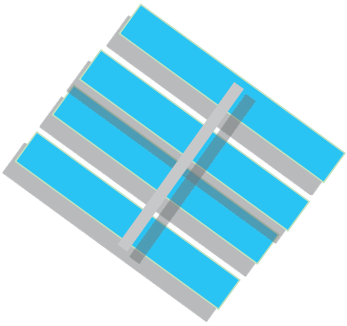
- **Premises or buildings used for the accommodation of patients:**

These are the buildings used to house the sick as well as all the staff employed in a hospital and the means necessary for the delivery of care. Are these premises spacious enough to accommodate patients so that they can be transported without too much difficulty? Are the buildings containing the various services far from each other? These are all questions that deserve answers. There are five main sectors in a hospital:

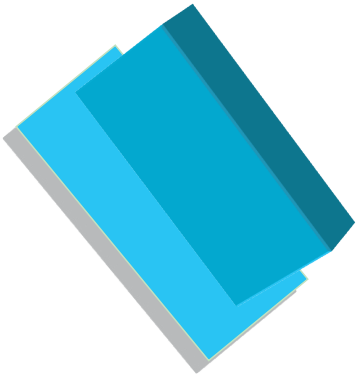
– Emergency services
– hospitalization services,
– The medical-technical services or what is commonly called the technical platform,
– logistics services,
– Administrative and technical services.

This subdivision of the hospital into several entities is interesting to carry out since they are entities assuming different functions although complementary. Therefore, it is interesting to highlight how these buildings are arranged in such a way that they best meet the main function of a hospital, which is the production of care in the best conditions. It is the architecture that ultimately translates, in space, the reality of the development of these different sectors in question. The architectural options selected for the design and construction of hospitals are numerous. Indeed, we retain four architectural options which served as models whether in Algeria or elsewhere around the world which are: the model of superposition, the model of juxtaposition, the integration model and finally the suburban model. The design and construction of hospitals in Algeria or elsewhere obey these different architectural models either faithfully or by mixing two of them.

- **Pavilion model:** this is not adapted to the economy of traffic which is at the origin of the conceptions of the various architectural models since the movements of the patients and visitors are more pedestrian than mechanized and are therefore longer and more painful.

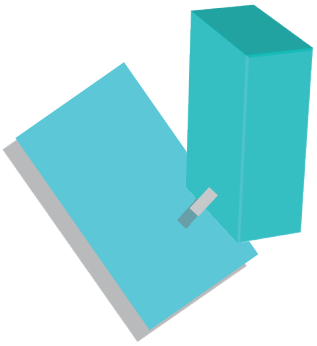


- **Layering model:** has as main advantages a significant reduction in horizontal movements considered slow and costly and a more limited footprint. Patients are moved vertically when it comes to carrying out additional examinations on them. The major concern that arises is when the elevators break down, it is then very difficult to move the sick, especially for those who are unable to move and for visitors, the number of floors to be climbed to access hospital services present inconveniences for elderly subjects in addition to the risk of congestion likely to be created when moving to the different floors overlooking the building whose containers are identical or different decrease as you climb the floors. Nevertheless, this formula has drawbacks on the architectural level because it lacks flexibility due to the constraints imposed by the presence of the hospital services on the base on which they rest.



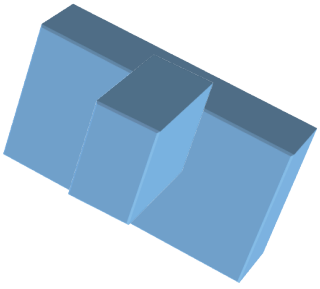
- **Juxtaposition model:** this model presents practically the same advantages as those retained for the superposition, a fortiori since these two architectural options are

almost similar. However, the only difference is when moving patients, which is now not only vertical, but from vertical to horizontal, which increases the journeys made by patients and visitors. In the event that the medical-technical services are annexed to those of the hospitalization, but are not connected by a single passage, the patients will be obliged to leave completely the "block" used for the hospitalization to carry out the additional examinations, resulting in additional inconvenience for patients already afflicted. From a strictly architectural point of view,



This option is best suited to flexibility since it allows the necessary accommodations to the requirements of the evolution since it is possible to consider the extension of a storey beyond the size of the underlying one. On the other hand, the length of the horizontal paths increases, as well as the influence of the surface on the ground.

- **Integration model:** is an architectural option which met with a few followers at the start but whose evolution in medical techniques has, however, shown its limits. Indeed, some medico-technical services interest several if not all disciplines, such is the case of medical imaging or endoscopy, the choice of their location becomes difficult and ambiguous. The exercise of integration has sometimes been pushed further to the point of bringing together the surgeries in the same entities of beds and technical rooms. Such a situation is untenable since we create hospitals in a single hospital and an uncontrollable chaos in the circuits. However, this architectural option does not exist in its systematic form.



- **The design of care units or hospitalization units:**

Having reviewed the design of hospitals, what about the design of care units or inpatient units? It is in the Anglo-Saxon countries and in particular in the United States of America that we have seen the appearance of research groups on the planning and organization of hospitals and studies have been carried out in this direction by experts constituted mainly administrators, doctors, nurses and architects. The latter conducted experiments to determine the functional requirements of the care unit. They sought, above all, to define the fundamental principles to be retained for the design of current units knowing that any particularity due to a specialization could be studied taking into account these principles. It is the requirements of the three main users, namely: the patient, the doctor and the care team, that are taken into consideration to define the functional needs that make it possible to create an effective care unit. In reality, it is from the analysis of the work of the care team that these needs were established. The ambition of all this research work is not to find a definitive shape for the care unit, since any new construction can be redesigned in the light of the problems caused by previous constructions, but to define its main characteristics. it is from the analysis of the work of the care team that these needs were established. The ambition of all this research work is not to find a definitive shape for the care unit, since any new construction can be redesigned in the light of the problems caused by previous constructions, but to define its main characteristics. it is from the analysis of the work of the care team that these needs were established. The ambition of all this research work is not to find a definitive shape for the care unit, since any new construction can be redesigned in the light of the problems caused by previous constructions, but to define its main characteristics.

- **The number of beds:**

Considered for a very long time as the tool for quantitative assessment of hospital activity, the "bed" criterion has however lost all economic significance. Today, the average length of stay for patients must be reduced. Furthermore, the attractiveness of a service can be measured in terms of patient admissions or consultations. Nevertheless, there are other more medical criteria allowing a more detailed analysis of the activity of hospital establishments and services. This involves analyzing this activity through the systematic collection and computerized processing of minimal and standardized medico-administrative information contained in the standardized discharge summaries (RSS). All the data collected will then be classified into a deliberately limited number of groups of stays presenting a medical similarity, in other words benefiting from the same treatment and whose cost of care is similar, the

example of homogeneous groups of patients (GHM). The homogeneous group of "GHM" patients is a French adaptation of the American "diagnosis related groups (DRG). The GHM is a classification that aims to group hospitalized patients into homogeneous groups whose main diagnoses present a medical coherence, just as their management required the use of an identical or similar level of resources. The DRGs therefore constitute a medico-economic classification of hospitalized patients who are part of an objective and a logic of hospital management. That said, each GHM must correspond to the same main diagnosis and the same level of use of resources, from which any deviation is synonymous either with an unfortunate medical error that should be rectified or with an excessive use of resources that must be justified. In France, there are 471 GHMs which constitute an exhaustive classification of patient stays in hospital. In Algeria, such a classification first requires that the main diagnoses be transcribed on the shuttle form, as well as the determination of the cost of a hospital stay for a GHM. each GHM must correspond to the same main diagnosis and the same level of use of resources, from which any deviation is synonymous either with an unfortunate medical error that should be rectified or with an excessive use of resources that should be justify. In France, there are 471 GHMs which constitute an exhaustive classification of patient stays in hospital. In Algeria, such a classification first requires that the main diagnoses be transcribed on the shuttle form, as well as the determination of the cost of a hospital stay for a GHM. each GHM must correspond to the same main diagnosis and the same level of use of resources, from which any deviation is synonymous either with an unfortunate medical error that should be rectified or with an excessive use of resources that should be justify. In France, there are 471 GHMs which constitute an exhaustive classification of patient stays in hospital. In Algeria, such a classification first requires that the main diagnoses be transcribed on the shuttle form, as well as the determination of the cost of a hospital stay for a GHM. there are 471 GHMs which constitute an exhaustive classification of patient stays in hospital. In Algeria, such a classification first requires that the main diagnoses be transcribed on the shuttle form, as well as the determination of the cost of a hospital stay for a GHM. there are 471 GHMs which constitute an exhaustive classification of patient stays in hospital. In Algeria, such a classification first requires that the main diagnoses be transcribed on the shuttle form, as well as the determination of the cost of a hospital stay for a GHM.

- **The technical platform or medical-technical services:**

The technical platform or the medical-technical departments are represented by the radiology department, the medical analysis laboratory, the rehabilitation

department, the functional explorations and the endoscopy department. The medico-technical services constitute a response to the hospitalization services by helping them through investigations, establishing diagnoses and monitoring the therapies implemented. The evaluation of the activity of these services or the quality of the responses they provide to hospitalization services can be analyzed according to two essential criteria, namely:

- **the rapidity** means that these results must be provided on time. A result provided late disrupts the work of the attending physician who would thus be forced to postpone the diagnosis, which necessarily has repercussions on the length of the patient's possible stay or that he carries out his medical visit to patients who do not have not received their results on time outside of the initial schedule.
- and the reliability of the results of the examinations or analyzes rendered. Reliability can be measured:
  - By the absence of anomalies in the results provided but cannot be limited to this,
  - A grouping of the examinations and, their restoration in this state, can help the doctors by their simple visualization to detect an improvement or a deterioration of the state of health of its subjects whereas the results provided separately do not allow it.
  - It is the frequent breakdowns of medical equipment or the absence of reagents and consumables that are most of the time the cause of delays in the provision of some or all of the results of these examinations.

- **The rate of medical and paramedical supervision per bed:**

The care activity requires the collaboration of several health professionals. For the year 2001, there were 61% of general practitioners in public health structures. Consequently, the operation of hospitals is ensured by general practitioners, even for certain basic specialties such as internal medicine, pediatrics, general surgery and obstetrics gynecology. The total number of paramedics has increased very little in ten years. Indeed, the number of state-certified nurses, certified nurses and paramedical assistants was 82,362 in 1991, 84,065 in 1996, 85,843 in 2001 and 86,021 in 2002. Although in 2001, paramedics represent almost half of the workforce in healthcare establishments and that there are, on average, 3.2 paramedics per practitioner, the fact remains that their number remains below the felt needs because the doctors only make their diagnosis and ensure the follow-up and therapeutic control of the patients. Nevertheless, it is the paramedics who remain at the bedside of these patients by providing them with care, by ensuring their daily toilet, by being responsible for alerting the doctors in the event of complications which arise...

- **The number of medical specialists:**

Medical schools around the world recognize fifty three different medical specialties. Thus, the specialization of medicine is increasing, still it has not yet revealed all of its secrets. Medical specialists are subdivided into two categories:

- Public health specialists practice in the various public or private health structures,
- University hospitals are attached to university hospitals.

Nevertheless, the initial university training provided at the level of the faculties of medicine is the same for all, giving rise to the issuance of a specialized medical studies diploma (DEMS). It is the success of the master's examination open to public health specialists that gives rise to the rank of university hospital doctor. Unlike other specialist physicians required to provide specialty care, university hospitals are responsible for supervising the training of general practitioners by providing university courses in addition to receiving medical students or residents for practical internships. Alongside these training activities, the university hospital staff carry out care activities like their public health colleagues.

Public hospitals in Algeria suffer greatly from the lack of medical specialists. In fact, the public care sector does not present any attraction in terms of remuneration and working conditions for the luminaries of medical practice who prefer to settle in a private capacity and moreover in the country's major cities or in urban centers.

On the other hand, from a strictly medical point of view, medical specialists working in the public healthcare sector find there fertile ground for excelling in their profession, given that they receive patients presenting with various illnesses, the treatment of which certainly allows a refinement knowledge of these diseases, their symptoms, their evolution and finally the most appropriate way to treat them since they themselves monitor their patients. However, full-time practice poses enormous difficulties for hospital-university staff who are forced to perform tasks that are not within their purview.

The absence of the simple medical secretary is likely to constitute a serious obstacle to the work accomplished by these medical specialists forced to do several things that do not fall within their prerogative, sometimes leaving aside the essential by worrying about the superfluous. . Indeed, few are those who manage to transcribe the acts performed on patients for lack of medical secretaries or the time necessary to do it themselves. It happens that the medical specialist lifts the patient himself for lack of a better distribution of tasks within a hospital department or a medical team.

- **The existence of intensive care or the creation of intensive care units (ICU):**

The creation of these units corresponds to groupings of patients, equipment and nursing staff. The patients supposed to be admitted usually correspond to those whose

vital functions are in danger. Admission to the ICU is urgent and unscheduled, however, some admissions may be carefully timed for patients who have just undergone major cardiac or neurosurgical operations. The conditions treated in the ICUs are generally severe, with sudden onset such as multiple traumas and cerebral hemorrhages or more progressive deterioration in the state of health of patients following cardiac or respiratory failure. The hardware these units require is sophisticated. The hardware these units require is sophisticated.

The nursing staff must also be a specialized staff made up of medical specialists who have undergone training in intensive care after a primary specialty and specialized nurses who must have a certificate of competence in these same types of care These units have certainly need this sophisticated equipment but they also need technicians in charge of its maintenance.

- **External consultations**
  There are three types of patients:
- Patients leaving a hospital department after a stay in hospital who return to consult, by appointment given by the attending physician, for possible follow-up and therapeutic control,
- Patients who go to specialized consultation structures oriented by general practitioners
- Finally, patients who turn to public or private structures, on their own initiative, for possible consultations, whether in general medicine or specialized medicine.

The first category of patients benefits from regular therapeutic follow-up until the total stabilization of their state of health, especially for those who have serious or chronic illnesses for which the duration of treatment is lifelong. The second and third categories are those whose behavior tends to arouse some apprehension for the structures responsible for welcoming them. Indeed, it happens that general practitioners refer patients to specialized structures without their state of health requiring any specialist medical consultations. These general practitioners can, in certain cases, take initiatives by deciding themselves on the treatment to be prescribed for patients presenting no medical seriousness. Due to a lack of loyalty to a treating doctor (general practitioner) or to a family doctor, outpatients who are part of the third category end up going directly, without prior notice, to a general practitioner to consult a specialist doctor. . In France, a patient must first consult his doctor (general practitioner) before the latter directs him if necessary to a specialist. In Algeria, the new health law provides for or establishes the concept of attending

physician. a patient must first consult his attending physician (general practitioner) before the latter directs him if necessary to a specialist. In Algeria, the new health law provides for or establishes the concept of attending physician. a patient must first consult his attending physician (general practitioner) before the latter directs him if necessary to a specialist. In Algeria, the new health law provides for or establishes the concept of attending physician.

- **The existence of an emergency service:**

"The emergency department is the place of reception for all patients presenting to the hospital for a consultation or hospitalization whose care has not been programmed". On the other hand, the notion of urgency can be defined as "requests for care requiring diagnostic research and a therapeutic decision within a very short time. Or again, it is an expressed need for rapid unscheduled diagnostic and/or therapeutic care leading to consultation in a healthcare establishment".

The emergency is distinguished by its random nature, which means that the number of patients going to the emergency department could not be defined beforehand. Indeed, these previous definitions do not take into account the difficulty in which the notion of urgency falls, which can be found in the triad below:

- The urgency can be felt by the patient himself who ultimately turns to a health establishment or more precisely to the emergency department;
- The urgency can be perceived by the patient's entourage who then evacuates him to a care structure;
- Finally, the urgency can be real when it emanates from the health personnel following elements of investigation on the person of the patient.

Emergency services are considered to be the real strength or weakness of a healthcare system. Generally, a malfunction of the emergency services is a source of real problems for the healthcare system taken as a whole. On the other hand, better organization of emergency services would simultaneously have positive effects on the quality of reception and care, and more particularly efficiency in the care of patients. The current dysfunctions that characterize the emergency services in public health establishments in Algeria are mainly due to many parameters as follows:

- The human resources assigned to the emergency services prove to be insufficient most of the time, especially with regard to the medical profession. Indeed, it is the interns who are responsible for the reception of emergencies whereas it should be required that this reception be carried out under the effective and permanent responsibility of a doctor trained in emergency (emergency physician). The presence of interns is desirable because emergency services are privileged places for

training, but they must not carry out their activities alone without being supervised by an experienced doctor;
- The paramedics assigned to the emergency services are shared with other hospital services;
- The technical platforms are insufficient, especially for certain extra-hospital structures which have no other alternative than to direct the patients who go to their levels at the hospital structures forced to take on the emergencies alone, which has led to the overload of work for the staff who work there and their demotivation

The number of people admitted to emergency departments is growing steadily with the epidemiological transition characterizing the country, which is seeing the birth of new pathologies, the modification of the age pyramid linked to the demographic transition is seeing the appearance, in turn, of cardio- vascular, added to this the increase in traffic accidents, domestic accidents and accidents at work. The lack of specialization of the emergency services constitutes a major flaw in the current organization of the distribution of care, at the origin of the massive recourse of patients to medico-surgical emergencies.

The absence of autonomy of the structures in charge of the emergency compared to the structures in charge of the consultations and hospitalizations thus constitutes a bad recognition of the hospital emergency. Access to care is almost free, hence the growing medicalization of cases related mainly to stress than to proven illnesses and emergency services remain the reception services for all forms of addiction and for all scourges. social. Therefore, a rehabilitation of the emergency services in the hospital or an identification of the emergency function is necessary. In effect,

The emergency function in the hospital must, in fact, be recognized as a function in its own right with a head of service, having his own means of action such as medical and paramedical teams added to a hospitalization service of very short duration equipped with an adequate technical platform.

The economic logic which implies the rationalization of the use of means goes in the case of emergency in a diametrically opposite direction, that is to say that one cannot ask an emergency service to operate permanently. , without any interruption, to face a growing demand for care without providing it with sufficient human and material resources and, moreover, its own. However, health establishments do not and cannot all have, within their emergency services, numerous medical personnel with proven skills, assisted by paramedical personnel provided, equipped with complete and efficient technical platforms for to be able to receive and treat as appropriate all the urgent cases that come their way.

Working in these departments requires a great deal of patience, physical strength to overcome a heavy workload and, above all, the ability to deal with the emergency in time and timely ventilation of patients if necessary to appropriate hospital services.

Quantitative evaluation in hospital emergency medicine can be done using the dashboard, which is the tool for carrying out this evaluation effort. Indeed, the description of the activity of the emergency services is based on a range of information usually collected for each patient and stored in a database. These data can be expressed and brought together in a dashboard, easy to use with simple computer data entry and applicable to all emergency services. The generalization of the use of the dashboard would eventually allow a homogeneous quantitative description of the activity and a comparison between the different emergency services of the country to finally determine those whose activity is dense from those where the activity is of less importance. Nevertheless,

Dashboard, tool for quantitative evaluation of emergency services activity

Number of passes
Of which < 15 years
Of which ›75 years
Gender:man Woman
Passages after medical advice (total)
Of which attending physician
Of which SAMU
Of which internal emergency
Of which transfer from another institution
Of which other doctor
Transportation
Samu
Firefighters
Ambulance
Police/gendarmerie
Own means
Origin of patients outside the health sector
Sick person with medical records in hospital
Classification of patients
Supported
External consulting physician
Biology
Conventional radiography
Duration of passage
Orientation

Hospitalization
Emergency hospitalization unit
Short trip
– medicine
– visceral surgery
– bone surgery / neurosurgery
– intensive care
– pediatrics
– psychiatry
Transfer (total)
Insufficient technical platform
No beds available
Personal convenience
Psychiatric sector
– reasons for seeking care
– main diagnoses

Source: Tenaillon.A& Labayle.D "the internal book. Emergencies", Flammarion editions, medicine sciences, Paris, 1983.

On the other hand, there are many tools for evaluating quality in emergency departments. Indeed, there are indicators of dysfunction supposed to reflect the non--quality of the care provided within these services, for example:

- patient complaints,
- Deaths recorded during admission to the emergency services,
- Patients leaving against medical advice or those leaving these services before examination or treatment.
- In addition, the study or the evaluation of the medical file can inform us about the exercise of medical practices and their control,
- Complementary examinations provide information on care procedures, on the quality of diagnosis and referrals, and on medically inappropriate admissions.

- **The existence of a health and hospital information system:**

The control of information is the determining stake of any organization including in a health organization. Collecting information then processing it and bringing out the result to finally disseminate it in order to allow decision-making, in normal or crisis situations, requires specific skills and more appropriate tools such as new technologies of the information and communication (ICT). The use of NTIC has, today, gained all the sectors of activity of the man. That said, the health sector cannot lag behind this development marking the transition from the era of manual information processing

to a new era where information is increasingly automated. Knowing that NTIC bring together the processes of collection, storage, processing and dissemination of data (texts, images, sound, etc.), the elements making up NICTs are of two types: -material (work units: computers, peripherals, etc.) -immaterial (software, databases, communication networks). The process of setting up the health information system (SIS) is based on NTIC. The changes that such a process can possibly induce both in health practices and in structures by strongly contributing to their decompartmentalization through the sharing of information.

- **The existence of a health and administrative organization**

The health organization in Algeria is developed in three levels namely: the national level, the regional level and finally the level of the wilaya. There are several support structures for the Ministry of Health, Population and Hospital Reform at the national level. These structures act in several areas and each one has very specific missions to fulfill:

- **The National Board of Health:**the latter is responsible for studying, developing and proposing to the minister responsible for health the elements of a national health policy. It proposes the list of health priorities that should benefit from a public health program and prepares a report periodical on the state of health of the population;
- **The National Institute of Public Health (INSP):**Its mission is to carry out studies and research in public health which make it possible to provide the scientific and technical instruments necessary for the development of health action programs and the promotion of public health in terms of health information, communication social, disease control, health protection, training and research;
- **The Pasteur Institute of Algeria:**Its mission is to contribute to the epidemiological surveillance of the pathologies for which it diagnoses, to the promotion of hygiene in general and to the quality of the environment as well as to the training, development and retraining of laboratory personnel , to import and distribute the serums and vaccines for which it is responsible;
- **The central hospital pharmacy (PCH):**Its mission is to ensure the supply of public health structures with pharmaceutical products. It is responsible for the functions of regulation and management of strategic products;
- **The National Blood Agency:**has as its mission the elaboration of the blood policy, the organization of blood transfusion and the elaboration of rules of good practice for the exercise of the transfusion activity;

- **the national school of public health (ENSP) which became (ENMAS):**Its mission is to provide training and development programs for the management staff of health establishments and structures, to retrain public health practitioners responsible for inspection missions, to participate in the popularization of modern management approaches, methods and techniques ;
- **The national laboratory for the control of pharmaceutical products:**Its mission is to ensure the quality control and expertise of pharmaceutical products. It is responsible for the scientific and technical study of pharmaceutical products submitted for registration, updating technical databases with standards and methods for sampling, sampling and quality control of pharmaceutical products and monitoring the safety and effectiveness of marketed pharmaceutical products;
- **The national health documentation agency (ANDS):**has the mission of making available to personnel and health structures, all documents, works, publications and didactic means;
- **The National Pedagogical Institute for Paramedical Training:**has as its mission the evaluation of lessons, the production of documentation and the development of research applied to paramedical training;
- **The National Toxicology Center:**has as its mission the analysis and expertise of any potentially toxic product or substance and toxicological information with a view to protecting the health of the population;
- **The national center for pharmacovigilance and materiovigilance:**Its mission is to monitor undesirable side reactions due to the use of drugs placed on the market and to carry out any study or work concerning the safety of use of drugs and medical devices.

At the regional level, there are five health regions which cover a greater or lesser number of wilayas;

- At the level of the wilaya, we find
  - a health and population department (DSP)
  - a school screening unit (UDS);
  - a hygiene laboratory;
  - a paramedical training school with 12 annexes spread over 34 wilayas;
  - public health establishments around which the distribution of care is organised;
  - The private sector is increasingly involved in this distribution of care alongside the public sector.

- **The existence of a formal mechanism for evaluating the quality of care**

The quality of care at the level of a health establishment cannot be achieved without the establishment of formal mechanisms capable of evaluating this quality in order to meet the basic needs of a patient. Accreditation of healthcare establishments carried out by independent bodies can be one of the mechanisms for this evaluation, since it is difficult for an establishment to be a judge and a stakeholder in an undertaking where all the aspects linked to its operation. Nevertheless, the regulations concerning the daily operation of these establishments must evolve in the sense that any indicator making it possible to assess the quality of the care provided is integrated into their decision-making process. The regulations could come from the public authorities, wishing to break with the archaic processes which govern the operation of health establishments in Algeria, health establishments themselves wishing to improve the quality of care dispensed to their users or finally financing bodies, which, under the impetus of the contractualization that binds them with health establishments would like to put an end to entrenched habits refusing any effort to transcribe acts into standardized documents related to patients in order to issue them invoices which they will receive. The information concerning the acts performed, in public or private health structures, is difficult to gather without the availability of documents related to the patients.

– **The shuttle sheet**reflects the activity of a service within a health establishment. It also allows the establishment to invoice its services to the bodies responsible for funding. His attire must therefore be required;
– **The administrative file**is intended to ensure that all the elements necessary to know or identify the patient and to connect with his family are rigorously mentioned;
– **The nursing record**is intended to ensure that the elements contained in this file are consistent with the approach that should be followed by the nursing profession in similar situations;
– **The medical file**retraces the different elements, namely admission, hospitalization, discharge and the care provided to the patient, which are precisely defined by regulatory texts. We too often deplore that the medical profession is more or less disinterested in the proper keeping of this file, whereas it is essential when medical errors exist and can lead to legal proceedings. Particular attention must therefore be paid to the drafting of doctors' prescriptions, which must be nominative, dated and signed.

Doctors find it difficult to transcribe their acts. This transcription of medical acts is likely to gather useful information on the patient as well as on his illness, which is

supposed to be used by the healthcare establishment and even by the political decision-maker. Indeed, this information is very important for the care establishment supposed to collect data on the management and traceability or the path followed by the drug, on the consumable, on the use of beds and equipment on the one hand. On the other hand, the information collected on the diseases can be used, at the national level, by political decision makers to work out their health policy and set up adequate health programs to eradicate these diseases definitively or at least prevent them.

The quality of care cannot be limited to the proper keeping of these documents since the basic needs of patients are numerous and can be summarized as follows:

- To the quality of the reception which cannot be limited to simple formulas of respect and courtesy;
- To the means made available to the patient to facilitate spontaneous breathing, for example the ventilation of the room or even the pillows;
- Control of the food served to the patient who requires eating and drinking as required in the case of a high or low calorie diet;
- management of patient mobilization, comfort and safety;
- Prevention of the risk of falls in hospital departments;
- To support urinary function;
- Taking into account aspects related to the safety of the care provided (anaesthetic safety, sterilization safety);
- Respect for the confidentiality of information that doctors hold on the patients they receive in their department;
- The availability of sufficient means to equip the operating room;
- Checking the patient's temperature;
- Control and monitoring of the occurrence of nosocomial infections;
- Controlling, taking into account the attitudes of the staff with regard to the patient's rest and the soundproofing of the rooms;
- Taking into account the patient's needs for expression and communication;
- Taking into account the cultural specificities of each patient;
- To the management of both physical and moral pain;
- To personal hygiene;
- environmental health;
- The systems put in place for sorting waste, whether it is waste from healthcare activities assimilated to household waste (DAOM) or waste from healthcare activities with infectious risks (DASRI)…
- Taking into account the explicit needs of the patient and his implicit needs (nosocomial infections)

- On-going training (of the various personnel in exercise) which takes precedence over basic training
- Setting up information systems
- Declarations of medical causes of death
- To the transcription of acts performed on the patient
- At the introduction of ICT
- To the development of epidemiology
- On the health watch
- Note that intangible elements predominate over material elements

Conclusion:

In light of all these developed elements, the evaluation of a healthcare facility can be performed. Additionally, the overall functioning of a healthcare facility and the structural elements of care constitute the focal points on which this evaluation can be conducted. However, intangible elements are becoming the most prominent factors as they are capable of creating more value for today's hospitals.

Bibliography

Anhoury P., Viens.G., 1994, *Gérer la qualité et les risques à l'hôpital*, Paris.

Barral E., 1977, *Economie de la santé: faits et chiffres*, Paris.

Basset B., Chaperon J., Frattini M.O., Jarno P., Keller C., 1999, *Hôpital et santé publique*, Rennes.

Beresniak A., Duru G., 1994, *Economie de la santé*, Paris.

Breack P., 1996, *Hygiène et qualité hospitalières: évaluation et accréditation des structures et des procédures de soins*, Paris.

Castiel D., 1999, *Economie et santé quel avenir*, Paris.

Ciais M., Gozlan C., Phelippot F., Rivet M., 2005, *Hygiène hospitalière: recommandations à l'usage des professionnels de santé*, Cedex.

Giraud A., 1992, *Evaluation médicale des soins hospitaliers*, Paris.

Gremy F., 1987, *Informatique médicale: introduction à la méthodologie en médecine et santé publique*, Paris.

Grenier B., 1989, *Décision médicale*, Paris.

Guide en organisation hospitalière dans les pays en développement, ministère des affaires étrangères, 2001, Paris.

Hacquart G., 1976, *Aspects économiques de l'unité de soins hospitalière*, Paris.

Hart J., Lucas S., 2003, *Management hospitalier: stratégies nouvelles des cadres*, Paris.

Lambert D.C., 2000, *Les systèmes de santé: analyse et évaluation comparés dans les grands pays industriels*, Paris.

Levy E., Bungener M., Dumenil G., Lafarge H., 1977, *Introduction à la gestion hospitalière*, Paris.

OMS, 1978, *Principes généraux de l'évaluation des programmes de santé*, Genève.

Oufriha F.Z., 1992, *Cette chère santé: une analyse économique du système de soins en Algérie*, Alger.

Oufriha F.Z., 2002, *Système de santé et population en Algérie*, Alger.

Parmentier G., 1998, *Accréditation et qualité dans les établissements de soins. Pourquoi? Pourquoi faire? Contribution aux réflexions du conseil d'administration de l'agence nationale d'accréditation des établissements de santé (ANAES*), Hospitalière privée (U.H.P), Pontoise, janvier 1998.

Salmi M., 2006, *L'inscription et la réalisation de projets d'équipements publics sanitaires en Algérie: entre centralisation et décentralisation,* "De réforme en réforme: un système de santé à la croisée des chemins".

Salmi M., 2006, L'intégration des nouvelles technologies de l'information et de la communication (NTIC) dans le système d'information sanitaire (SIS) en Algérie, "De réforme en réforme: un système de santé à la croisée des chemins".

Salmi M., 2009, *Administration du personnel de santé ou gestion des ressources humaines: l'enjeu actuel de l'hôpital public en Algérie » in cahiers du CREAD*.

Salmi M., 2009, *L'accréditation des établissements de soins en Algérie: outil de la reconnaissance, de la mise en œuvre et de l'incitation de la qualité des soins » in cahiers du CREAD*, Alger.

Salmi M., 2014, *Les attentes majeures de l'évaluation des politiques publiques*, "Economie et Société ", no. 10.

Salmi M., 2015, *Système national de santé en Algérie: quels éléments pour une stratégie de redéploiement?,* "Algérienne des Sciences Sociales et Humaines", no 4.

Salmi M., 2018, *Rethinking the role of the state in the health sector in Algeria by associating the private health care sector: the combined effects of globalization or a simple institutional reorganization?*, ATINER's conference paper proceedings series sos2018-0083, Athens, 28 August, 2018.

Salmi M., 2020, *The Treatment of Type 2 Diabetics through a Spatially-Centered Care Network: What Contributions? Case of DIABIR*, ATINER's Conference Paper Proceedings Series MGT2019-0193 Athens, 17 September 2020.

Salmi M., Thèse de magister: *Essai d'analyse et de réflexion sur l'organisation et la gestion des secteurs sanitaires en Algérie: éléments pour un diagnostic. Cas du secteur sanitaire de Larbaa Nath Irathen*.

Summary

The hospital today must undergo an evaluation as it is an inseparable element of the healthcare system and the core of the healthcare system. It is necessary to take stock of both its overall functioning and the structural elements of care that form the foundations on which all evaluation efforts are based.

Keywords: hospital today; general functioning, structural elements of care, evaluation.
Gel calssification 033

Tomasz Plata-Przechlewski*

Meat consumption trends 1995–2020

Introduction

Over the last 60 years, global food consumption increased from to ie. by 300%. This growth was caused both by increasing the world population from 3 to 8 billions of people, and by increased demand due to higher per capita income. In short there are more, more wealthy people. Moreover not only global food consumption has increased, but the structure of what was consumed changed. In particular faster than average increase in meat and animal-based products were observed.

This meat consumptions trends are generally regarded as harmful and the potential negative consequences of substituting meat for traditional foods are threefold:

- meat consumption is unhealthy (for consumers),
- meat production is economically inefficient (compared to plant-based food),
- meat production is harmful to environment being substantial source both of greenhouse gases and land degradation

Ever-increased number of papers warns that following the path of fast increasing meat consumption results in both environment and global economic catastrophe. Looking for possible soft-solutions (hard solution is a degrowth strategies) Vrenken et all (2014) based on EKC hypothesis looked for `turning point' in meat consumption and claimed they found one. The other paper which claimed that meat consumption follows EKC is of Cole and McCoskey (2013).

The aim of the study is to assess the trends in world meat consumption in last 60 years based on data from FAO food balance sheet. As it is assumed that the total meat consumption depends on income the consumptions is compared by World Bank's income groups. Finally two simple models namely Engel Curve, and Environment Kuznets Curve (EKC) hypothesis are tested and the results discussed with the above mentioned previous reports.

In particular both papers cited above are pretty dated and do not cover the last decade. Using the same data (FAO Food balance sheet) we try to verify if after ten years of ever-increased warnings, social-awareness and pro-environmental propaganda the world is closer to those `turning points'?

Data

FBS

We use data on food consumption and population from Food Balance Sheet (https://www.fao.org/faostat/en/#data/FBS) provided by the UN Organization for Food and Agriculture (FAO.)

FBS data on per capita and total of food supply are calculated as follows:

(production + import + stocks) – (export + feeding/non-food-usage/wastage + closing stocks)

The difference divided by population is per capita consumption

FBS is divided into hundreds of items (such as pepper or onion) and many item groups (such as Meat or Animal Products.)

Items/Item groups are measured as:

1. yearly per capita **quantity supply** (kilograms/per capita/year, abbreviated to kg/c/y)
2. daily per capita **energy supply** (**kilocalories/per capita/daily**, kcal/c/d),
3. daily per capita **quantity supply** (grams/per capita/day, g/c/d),
4. yearly total **quantity supply** (1000 tonnes)

We analyze the three groups: **meat**, **total intake** and **total protein supply** (ie animal and plan based protein). **Meat consumption** was measured with 1, 2 and 4; **total intake** was measured with 2; and **total protein supply** is measured with 3.

World Bank

To verify hipothesis on the relation between income and meat/total consumption we use data on GDP from the World Bank, namely we use GNI per capita (Atlas method in current USD; https://data.worldbank.org/indicator/NY.GNP.PCAP.CD)

World Bank per-capita income groups (2022) are listed in table 1.

Table 1. World Bank income groups

GNI pc	Income group
0–1084	low
1085–4254	lower-middle
4255–13204	upper-middle
13205–	high

Source: https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2022-2023

The database

The country with population less than 3mln was dropped from the analysis with about 130 countries left in the sample.

The balance is mantained from 1961 but in 2010 there was a methodology change. The new FBS is published from 2010 but for 2010–2013 period FAO published both versions. We computed averages of meat consumption in kg/per capita for this period (ie 2010–2013) for new and old FBS. In case of difference higher then 10%, the data was regarded as unreliable and the country was dropped from our panel. Only 105 countries left in the sample (the list of countries dropped can be found online at our github page) but these countries consumed 92.3% of total world meat supply in 2020.

When combined with GDP data from World Bank it appeared that there is no GDP data for 3 countries (China Taiwan Province of, Democratic People's Republic of Korea, South Sudan). Finally our sample contains 102 countries (which nevertheless consumed 90.7% of the total world meat supply in 2020.)

This database is used at exploratory analysis stage. To verify income-consumption relation we further restrict our sample. As both FBS and World Bank data contains many missing or unreliable (political changes) values we decided to use data from 1995 onward period. Thus our final panel contains 102 countries for 1995–2020.

Results

Exploratory analysis

Both protein and total intake rose steadily over the analysed period (cf figure 1). Protein consumption over the period 1961–2010 rose by 0.6% yearly on average, from

61.46 to 79.63 (g/c/d). Slight increase was observed over 2010–2020 period. The protein intake rose from 79.63 in 2010 to 84.57 in 2020 (0.6% yearly on average)

As far as **total consumption** is concerned it rose by 0.6% yearly on average over the period 1961–2010, from 2196 to 2858 (kcal/c/d). However over 2010–2020 period the growth rate decreased. The total intake rose from 2982 kcal/c/d in 2010 to 2858 kcal/c/d in 2020 (0.4% yearly on average)

The largest drop in growth was recorded in the **meat consumption**. It rose strongly by 2.2% yearly on average over the period 1961–2010, from 110 kcal/c/d to 230 kcal/c/d. However over 2010–2020 period the growth rate decreased. Meat consumption rose from 230 kcal/c/d in 2010 to 233 kcal/c/d in 2020 (only 0.4% yearly on average)

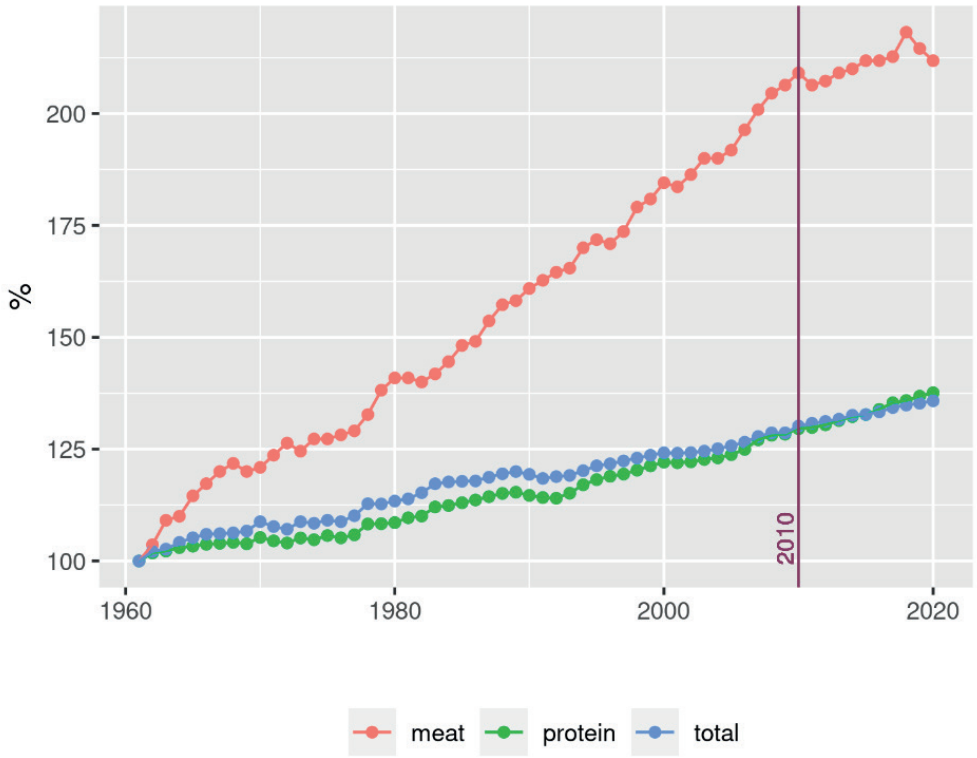


Figure 1. Meat/Protein/Total consumption (1961=100%)

The patters of growth depends on income of course. Total meat consumption by (World Bank) income class is presented in figure 2. Note that the figure shows the **total world consumption** (in kilotonnes) which is the combined result of the growth

of individual consumption and the growth of the population. We can observe strong growth in upper-middle class of countries, mild increase in high-income countries while decline both in lower-middle and low-income contries. In short the poor eat less, the rich eat more in the whole analysed period.

Figure 2. Meat consumjption (1000 tonnes)

Individual meat consumption (kg/per capita/year) by income classes (as defined in 2022) is analysed in figure 3. We can observe tiny drop in high-income group, significant increase in upper-middle group, and stabilization at low level in low-income class. The dispersion tends to decrease in all groups.

A more detailed analysis is available online in the supplementary material at author's github repo (https://github.com/hrpunio/Papers/tree/main/PSW_2023). Detailed analysis of meat consumption over 1961–2011 period can be found in Sans and Combris (2013). Finally ten-year projection for world food consumption (including meat) can be found in OECD and Food and Agriculture Organization of the United Nations.

Figure 3. Meat consumption (kg/capita/year)

Consumption-income relation

The environmental Kuznets curve (EKC) is a hypothesized relationship between various indicators of environmental degradation and per capita income. In the early stages of economic growth, pollution emissions increase and environmental quality declines, but beyond some level of per capita income the trend reverses, so that at high income levels, economic growth leads to environmental improvement.

In case of meat consumption and the most basic form the relation can be specified as:

$$Meat = b_0 + b_1 GDP + b_2 GDP^2$$

Equation (1) can be specified as

$$lnMeat = b_0 + b_1 lnGDP + b_2 lnGDP^2$$

If a relation between Meat consumption and GDP follows EKC it must has a turning point, ie. an income level above which the consumption of meat decreases.

Using data from 150 countries for the period 1980–2009 Cole and McCoskey (2013) claims that meat consumption follows EKC with turning point estimated at 36,4 thousad USD, that only few countries have enjoyed. In another study, Vranken et all (2014) using panel of 120 countries for the period 1970–2007 confirmed that meat consumption–income follows EKC, and estimated turning point at 32,0–55,0 thousand USD.

Alternatively to EKC we can apply another popular theory, ie. **Engel law** which assumes that consumption is under-proportional with income. This can be formally descibed by the power function with parameter b which can be interpreted as an elasticity

$$Meat = b_0 GDP^{b_1} \text{ or } lnMeat = lnb_0 + b_1 lnGDP$$

If meat consumption follows Engel law there is no `turning point' although meat consumption increase are every year smaller. Note that model (3) is nested in model (2).

Panel data analysis

Figure 4 presents scatterplots for meat consumption vs income and total intake vs income for our panel of data. (colour charts are available in the supplementary material)

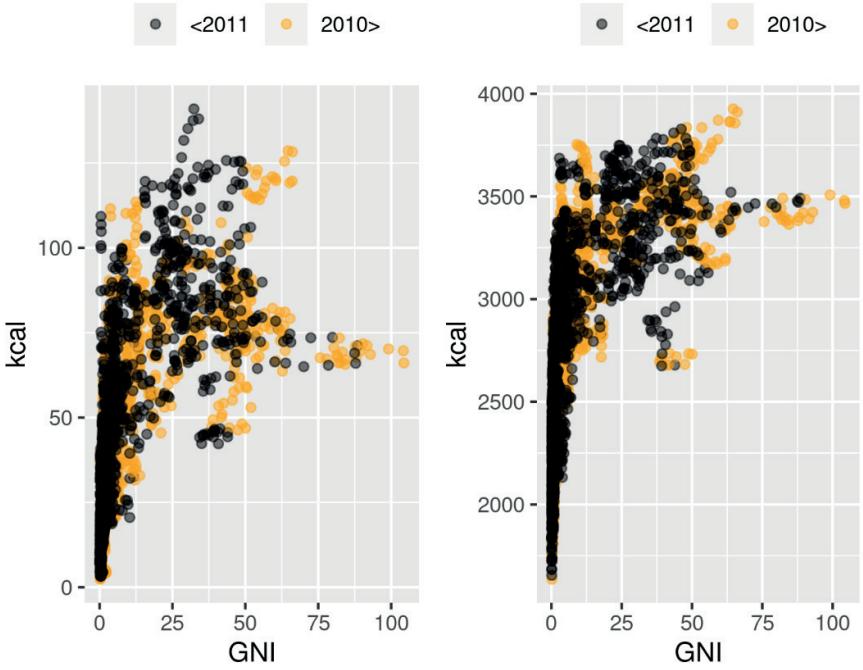


Figure 4. Meat and total intake vs GDP

We consider model 1–3 for Meat (kg/c/y), and Total intake. All models was estimated with pooled OLS using data panel of. 102 countries for 1995–2020. Table 2 presents results.

Table 2. Meat consumption (M1–M3) and Total intake (T1–T3)

Parameter	M3	M2	M1	T3	T2	T1
Intercept	3.0134	3.0542	25.8780	7.8145	7.8238	2518.9976
GDP	–	–	2.9956	–	–	–
GDP²	–	–	-0.0320	–	–	–
ln(GDP)	0.4185	0.5524	–	0.0935	0.1240	44.0635
ln(GDP)²	–	-0.0482	–	–	-0.0110	-0.4425
adj. R²	0.6632	0.6841	0.5974	0.7025	0.7256	0.5371
AIC	3417.1730	3266.3385	–	-4121.7129	-4311.9248	–
apex	–	309.2687	46.8099	–	284.1385	49.7931

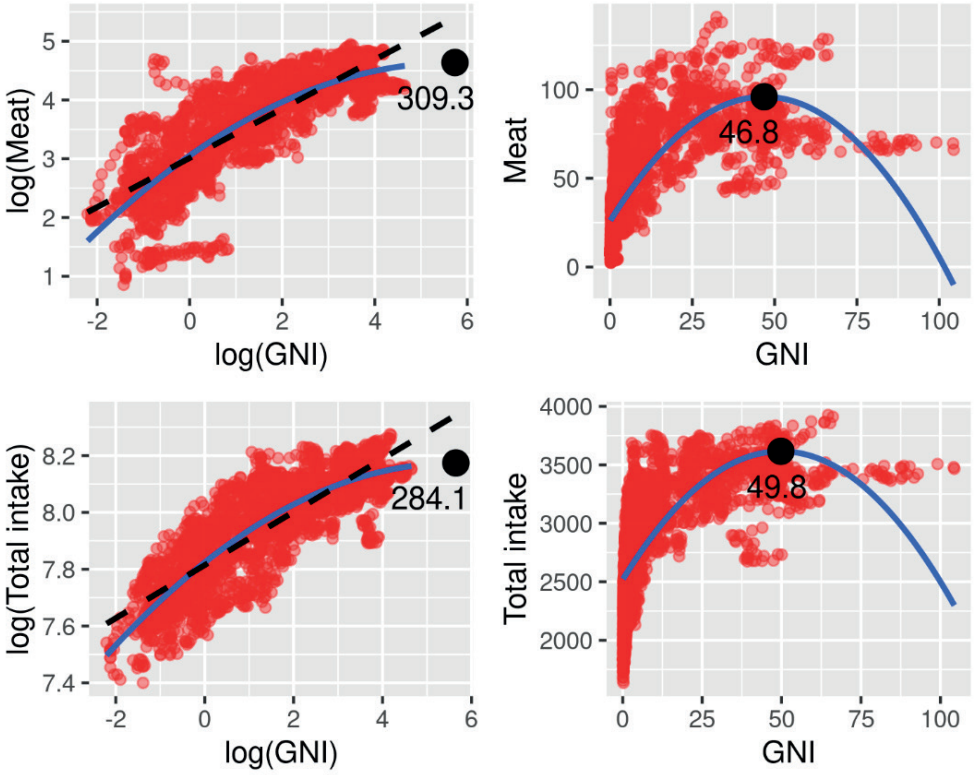


Figure 5. Fitted models

All parameters in all models are significant. Estimating M1/T1 we have got similar value for apex (aka turning point) as reported by Cole and McCoskey (2013) or Vranken et all (2014). However alternative models M2/T2 shows even higher fit (adjusted R^2) but apex values are absurdly high and there is no clear argument that M1/T1 should be preferred (cf figure 5) Is there any *turning point* at all? Models M3/T3 and M2/T2 are nested. There is slight gain in adjusted R^2 when using M2/T2 (EKC). AIC values are lower for M2 too (but not for T2), thus supporting EKC hypothesis (with ridiculously high apex value of 309.27)

Conclusions

On the average world meat consumption do not slow down in 2011–2020 decade comparing to earlier period (Sans and Combris (2015).) Contrary to results claimed in Cole and McCoskey (2013) or Vrenken et al (2013) we found no solid argument that meat consumption follows EKC. There is no soft-way or green growth (Hickel and Kallis (2020))

Technical remarks

This document is an abridged version of a report prepared as R-markdown document. The source file and the data are available at author's github repo (https://github.com/hrpunio/Papers/tree/main/PSW_2023)

Bibliography

Cole J.R., McCoskey S., 2013, *Does global meat consumption follow an environmental Kuznets curve*, "Sustainability: Science, Practice, and Policy", 9/2, pp. 26-36, https://www.tandfonline.com/doi/abs/10.1080/15487733.2013.11908112.

Hickel J., Kallis G., 2020, *Is Green Growth Possible?*, "New Political Economy", no. 25, issue 4, pp. 469-486.

OECD and Food and Agriculture Organization of the United Nations, OECD-FAO Agricultural Outlook 2023-2032 https://doi.org/10.1787/08801ab7-en.

Sans P., Combris P., 2015, *World meat consumption patters: An overview of the last fifty years (1961-2011)*, Meat Science 2015.

Stern D.I., *Environmental Kuznets Curve*, in *Encyclopedia of Energy*, Cutler J. Cleveland (editor) Elsevier Science 2004, https://www.sciencedirect.com/topics/earth-and-planetary-sciences/environmental-kuznets-curve

Stoś K., Rychlik E., Woźniak A., Ołtarzewski M., 2022, *Red and Processed Meat Consumption in Poland*, "Foods", 11, 3283.

Vrenken L., Avermaete T., Petalios D., Mathijs E., 2014, *Curbing global meat consumption: Emerging evidence of a second nutrition transition*, "Environmental Science and Policy", 39, pp. 95-106.

Warlenius R.H., 2023, *The limits to degrowth: Economic and climatic consequences of pessimist assumptions on decoupling,* "Ecological Economics", 213, https://doi.org/10.1016/j.ecolecon.2023.107937