Human Resource Audit-A Driver for Sustainability in the Health Care System. An Evidence from Romania

Abstract: The paper aimed a complex audit of human resources effectiveness in the Romanian health care system. People inside the system and the whole Romanian society have realized the importance of providing sustainable services in order to improve the performance indicators in the long run, for the benefit of both employees and patients. As we acknowledge that in developing countries the lack of skilled human resource both in respect to quantity and quality is a major problem, the paper constructs an composite index of sustainability to audit the human resources in the health care system from the perspective of quantity and efficiency in order to improve the access to health services and to ameliorate the quality and safety of medical act. Within the paper, the authors perform an objective audit of human resources emphasizing that a sustainable medical system not only supports expenditures, but also improves quality in the long run. Besides, we consider that sustainable strategy for retaining medical staff, especially in deficient medical specializations, good collaboration between hospitals and higher education institutions regarding training and development of human resources in this field are important factors in achieving sustainability of the health care system.

Keywords: audit; sustainability; health care system; human resources; medical staff

1. Introduction

The generally accepted definition for the sustainable development is that proposed by the Brundtland Report: “it meets the needs of the present without compromising the ability of future generations to meet their own needs” [1]. When it comes to sustainability of the health care system, it is quite obvious that it is related with the quantity and quality of human resources in the field. Besides, in the perspective of 2030, one direction of sustainable development is good health and wellbeing with a clear objective of ensuring healthy lives and promote well-being for all at all ages.

For 2019, The Knowledge platform/Sustainable Development Goals mentioned that “major progress has been made in improving the health of millions of people, increasing life expectancy, reducing maternal and child mortality and fighting against leading communicable diseases. However, progress has stalled or is not happening fast enough with regard to addressing major diseases, such as malaria and tuberculosis, while at least half the global population does not have access to essential health services and many of those who do suffer undue financial hardship, potentially pushing them into extreme poverty. Concerted efforts are required to achieve universal health coverage and sustainable financing for health, to address the growing burden of non-communicable diseases, including mental health, and to tackle antimicrobial resistance and determinants of health such as air pollution and inadequate water and sanitation.” Unfortunately, we foresee no progress for 2020 due to the pandemic which revealed that even those health systems which we considered to be the most efficient in the world proved to be as vulnerable as the ones in the poorest countries [2].

The expectations of all categories of stakeholders in the healthcare system, including here medical staff and patients, and fulfilling these expectations define the sustainability of the healthcare system because services are delivered by people to more and more demanding people (clients, patients). For this reason, understanding the issues of the health care system regarding human resources is the main step in achieving sustainability in this field (the structure of labour in the health care system taking into consideration deficient medical specializations, number of medical staff, migration problems) [3].

There are studies which refer to health system rather than health care systems because they consider that sustainability needs to focus on the main outcome population’s health and treating illness is a primary goal but not the main one [4]. But we believe that no matter are the words we use, sustainability of a medical system is defined by the following characteristics: healthy population, defined as a rate of number of people which get the highest level of health possible; efficient care (timely managed, patient centred); and fairness in providing care (lack of discrimination, equal treatment).

On the one hand, in order to achieve sustainability, we have to analyse efficiency versus inefficiency and to identify the sources of inefficiencies, generally for all countries and particularly for Romania, such as: the lack of professionals, migration of medical staff to developed countries, dysfunctional competition (we mention here that sometimes patients are willing to wait more or to pay more in order to be consulted by a very well-known doctor than going to a doctor they do not references about), minimising the role of nurses in the medical
system, bureaucracy when it comes for investments in innovative devices, distortions resulting from corruption etc. Besides it became clear lately due to the pandemic 2020 that a sustainable health care system has to cope with risks which have never been foreseen. And it became obvious as well that sustainability is more about human resources involved in saving lives than a rigid cost – benefit analysis. So that, we need to come back to a very simple economic principle that reminds us the individuals respond to incentives and satisfying people’s needs (medical staff and patients as well) is the main driver in achieving sustainability in the health care system.

On the other hand, we consider that building efficient policies for human resources in health sector are very important because they define the mission and vision for the entire sector, establish goals and priorities for the medium and long term in order to talk about sustainability. People become aware of the lack of coherent polices in the field when harmful effect of inefficient policies appear and consequently decisions based on this kind of policies cannot be good. Additionally, health policies are needed because they create a framework for evaluating performance based on setting objectives, resources required and responsibilities assumed by each and every health professionals [5].

We see human resource audit as a driver for sustainability in the health care system because health units depend on their labour more than any other type of organizations. Human resources in the health care system have to be competitive, competent, empathic but not exceeding some limits (the difficulty here is to identify the limits), they have to make decisions of life and death quickly and to assume the consequences of their actions. Furthermore, human resources weight a large proportion in the budget of the health sector and we have to offer a resource-based approach when we are coping with sustainability. Besides, we believe that poor costs / salaries for human resources in the health care system have huge opportunity cost in population’s health and economic growth of a nation.

A national sustainable health care system goes to sustainable development in a country because it is quite intuitive that human resources management in the health care system has enormous macroeconomic and social effects. But the effects are inverse as well: major trends in economy affect health care professionals on the medium and long term:

- **Innovation / new technologies**: they are used more and more, on a larger and larger scale, demanding new skills and knowledge from health professionals, with effects on their productivity and time management [6];
- **Socio-demographic changes**: and here we include all types of changes, starting with the increase of life expectancy in the developed countries, the availability of health professionals to work in less developed countries in order to give a chance for people in those countries to access health services, differentiation in gender work of health professionals, burnout in health care systems, brain drain of health professionals towards the most attractive health care systems regarding salaries and career opportunities, consumers of health care services became more and more demanding when it comes for their health [7-11];
- **Economic changes**: structural modifications made by the states which sometime cuts the expenditures for health and education [12].

Besides, human resources management and audit in the health care system need a cross disciplinary approach in order to achieve sustainability. The types of inputs are different (financial resources, educational trainings, working conditions) and they often do not depend on managers of health care organizations. Trade unions sometimes negotiate and establish work conditions and collective agreements and managers of health care units cannot make better decisions for health professionals [13]. A relevant audit for human resources in health care system has to take into consideration the time lag between an input and an output. For example, a 10% increase in the number of students in medical schools does not go to the same increase in the number of doctors in 8-10 years [14].

There are studies [15,16] which emphasize that during the last thirty years health care expenditures have been growing at a faster rate than gross domestic product (GDP) in all Organization for Economic Co-operation and Development (OECD) countries. And we cannot talk about sustainability of a system without taking into consideration the affordability of costs for those systems. And if this trend is still going on, the system cannot be fiscally sustained.

### 2. Materials and methods

In order to easily assess the sustainability of the health system from the point of view of the human resource we proceeded to construct a composite index of sustainability that surpasses the conceptual phase and gives us a structured way to measure sustainability.
Composite indexes are powerful tools for decision making and are based on a range of variables or individual performance indicators. They are very useful because they offer a “big picture” imagine of the result and evolution in time of the whole system and can be easily understood and communicated in presentations and other papers. The main drawbacks of such indexes are represented by technical challenges in construction. Increased attention should be given to the choice of performance indicators used and to the aggregation method.

2.1. Selection of variables

The first step in constructing such an index is to understand the final goal that it will be used for and then to choose the indicators that will ultimately be included and will become the index.

In our case, the assessment of HR sustainability in health should include several indicators from each of the four categories including: size and distribution of the health care workforce, health care workforce training, country’s level of economic development, and migration of health care professionals. Because of the lack of data, for equalization reasons and in order to avoid auto-correlation problems, we chose to use only one indicator per category. All the indicators used are presented in Table 1 and will be described below.

| Category                                      | Variable used                        | Expected relationship to sustainability |
|-----------------------------------------------|--------------------------------------|----------------------------------------|
| Size and distribution of the health care workforce | Number of medical doctors            | +                                      |
| Health care workforce training                | Number of graduates taking the residency exam | +                                      |
| Country’s level of economic development       | Medical staff median wage            | +                                      |
| Migration of health care professionals        | Number of certificates of good standing | -                                      |

As a proxy for the size of the health workforce we chose to use the total number of medical doctors reported by the Romanian Ministry of Health. Due to autocorrelation we discarded other measures of size and chose to use this one because the main sustainability issue of the Romanian health care system is the lack of medical doctors, while other categories of health workers like dentists, pharmacists and nurses do not pose such a big shrinkage problem [17]. Also, data for migration was only available for medical doctors, and not for nurses so in order to properly keep the proportions and better see the effects of migration we chose to use only the total number of doctors as a variable in the construction of our index. We acknowledge that this measure cannot capture the poor geographical distribution of medical doctors but we consider that part of the internal migration problem can be solved by increasing the total number of the health workforce.

When measuring the training of the workforce two directions can be taken. One is to evaluate the quality of training and the second to evaluate the quantity of training available. Our main goal is to assess the sustainability of the health system’s human resource and the main challenge in doing this is to establish the system’s capacity to provide fair access to medical services for the whole population. Keeping this in mind we chose a variable that measured the quantity of training available and we used the number of med school graduates that are taking the residency exam each year. Our opinion is that a larger number of residents will translate into a higher number of doctors available and also will indirectly raise the quality of the medical act due to higher competition among students and residents. This competition will determine them to fully appreciate the position obtained so far, to be more determined to finish the studies with high grades, to participate in research and to attend conferences and workshops.

The level of economic development of a country and the relation with the performance and sustainability of the HCS has been fiercely debated by academics. The vast majority chose to measure economic development by the level of GDP per capita or by the level of government expenditure for health services per capita. As our primary goal is to assess the HR sustainability in the health system, we considered that both measures relate indirectly to the economic wellbeing of the main stakeholders, the workforce. Even total expenditure for health is indirect related to staff economic wellbeing because it also includes the cost of prescription drugs and can be inflated by unnecessary costs generated by poor quality of the medical act like repeated readmissions in hospitals. We also consider that not all costs for endowment generate an incentive for doctor retention because
not all staff has access to the newly acquired equipment and does not benefit from the acquisition. So, we decided to use the most direct measure of health workers economic wellbeing, the medium level of wage for medical personnel.

The migration of health care workers is one of the main issues that leads to a loss of sustainability of the HCS by making the number of doctors insufficient in respect to the demand of health services in a country. One way to assess the magnitude of the phenomenon is by using questionnaires and conducting a study among students, residents or doctors. One such study applied to the students of Cluj medicine faculty found that in 2017 an alarming proportion of students, 84.7%, which had the intention to migrate [18]. The second solution is to use the number of total certificates for good standing issued by the Romanian College of Physicians. We acknowledge that there might be differences between the number of certificates issued each year and the number of doctors that actually migrated but because having this certificate issued requires time and effort we consider it to be a very good proxy for the number of doctors that left Romania to work in other countries.

2.2. Methodology and construction of index

All data used was collected from reliable national sources: National Institute of Statistics and Romanian College of Physicians, and international: Eurostat and WHO. After data collection, the next natural step is to check for missing entries in the time series. This lead us to the time interval of the analysis the ten year span between 2009 and 2018. Prior years were discarded due to the lack of data for some of the variables.

The second step is to standardize the data that comes initially in different units of measurements. Because of weighting concerns, the data has to be normalized before it can be aggregated in an index. Normalization refers to a process that transforms the data so that a common scale can be used and all data can be compared by a common reference [19]. A wide variety of methods like standardization, average or min-max, can be used to normalize data sets. A min-max normalization procedure was performed on all data resulting in variables within a 0-1 range.

One of the most important actions when constructing a composite index is weighing the variables. If all of them are considered to have the same relevance than an equal weight technique can be applied thus simplifying the process. In other cases, there are more techniques, some subjective and some more objective, that can be used to determine the weights assigned to each indicator. Between analytic hierarchy process, principal component analysis and entropy technique we decided to use the last one mentioned [20].

The entropy method is widely used to assign weights and it consists of calculating the entropy and the entropy weight [21]. There is an inverse relation between them so the greater the entropy is the smaller the entropy weight becomes. This means that the amount of relevant information provided by the indicator is low or inexistent and in such a case the analyst can discard the variable [22].

The steps taken were the determination of the evaluation matrix, the standardization of the matrix and the calculation of the entropy. The formulas used to determine the entropy and the entropy weights are shown in equations (1) and (2):

\[ E_i = -k \sum_{j=1}^{n} f_{i,j} \ln f_{i,j}, \quad i = 1, 2, 3, \ldots, m; \quad k = 1 / \ln n \]  
\[ W_i = \frac{(1 - E_i)}{\sum_{i=1}^{m} (1 - E_i)} \]  

3. Results

The calculated weights for each category are: \( W_1 = 17.31\% \) for the size and distribution of the health care workforce; \( W_2 = 30.38\% \) for the health care workforce training; \( W_3 = 38.94\% \) for the country’s level of economic development, and \( W_4 = 13.38\% \) for the migration of health care professionals.

After determining the weights allocated to each variable, we multiplied the values and aggregated them in order to obtain the final Health Care Human Resource Sustainability Index.

The values for each year are presented in Table 2 and the evolution of the index is presented in Figure 1. Figure 1 shows a consistent betterment of the Index in the last two years of our analysis, implying a rise in the level of sustainability of the human resource. The acceleration of the trend line can be perceived as a baseline for further improvement if adequate measures and actions are taken by the government to further support the raise in the system’s sustainability.
Table 2. The Health Care Human Resource Sustainability Index

| Year | Sustainability Index |
|------|----------------------|
| 2009 | 0.19                 |
| 2010 | 0.12                 |
| 2011 | 0.11                 |
| 2012 | 0.17                 |
| 2013 | 0.21                 |
| 2014 | 0.28                 |
| 2015 | 0.31                 |
| 2016 | 0.44                 |
| 2017 | 0.58                 |
| 2018 | 0.95                 |

The first section of Figure 1 shows a declining trend and a worsening index. This is mainly explained by the combined effects of a huge increase in the number of migration intentions of 112.85% between 2009 and 2011, together with a 13.79% decline in the number of med school graduates who chose to take the residency exam.

![Health Human Resource Sustainability Index graph](image)

**Figure 1.** Evolution of the Health Care Human Resource Sustainability Index

For the second section of the graph, we noticed a slight trend reversal and an improvement of the health care human resource sustainability index from 0.11 to 0.31 points. The rising trend has a slowly rising slope for the years 2011 to 2015. During this time span we could observe a 31.81% increase in the number of graduates taking the residency exam, a 29.4% rise in the wages of caregivers and a median 2% rise in the total number of doctors each year. The only declining influence was that related to the migration of medical doctors. In 2015, the Romanian College of Physicians issued a staggering 3857 certificates of good standing, the highest figure to date. The increase in the intentions to migrate was wan of 175.3% versus the beginning of the period.

The last three years of the analysis show a rapid increase in the value of the index and a high rising slope on the graph. This is mainly due to a trend reversal of the variable that measures the migration of medical doctors. During this time the number of doctors that left to work abroad declined by 40.05%. The total number of certificates of good standing is still by 65.02% larger than at the beginning of our analysis but the trend reversal together with other factors can bring that number down in the future. The main drivers of the improvement of the sustainability index are the 56.3% increase in the number of med school graduates that chose to take the residency exam and the 70.5% rise in the economic wellfare of health workforce.
Over the whole ten years the total number of doctors increased by 20.2% making the health system more sustainable from the point of view of access to medical services, the number of med school graduates taking the residency exam increased by 74.8% giving us high hopes for a larger and better trained health workforce in the future, the medium wage increased by 136.2% and the intentions of doctors to migrate towards developed countries increased by 65% thus having a negative influence on the sustainability of the system.

4. Discussion

The first step taken for the human resource audit was to define and to establish the limitations of the concept of human resource in a health care system. According to the World Health Organisation (WHO), health care personnel refers to all types of clinical and non-clinical staff, publicly or privately employed, that is responsible for all types of health interventions.

The human resource is by far the most important and valuable input in the health system and the one that mainly determines the outcome of the health services offered. The skills, the dedication, the motivation, the level of satisfaction of health care workers are key determinants of the quality of the care that they provide to patients. The relation between the overall performance of a health care system and the human resource involved is very complex and must be analysed from different points of view like the best mix between human and physical resources used; the level of correlation between the skills of the staff and the physical resources available; the optimal mix between the different types of health practitioners and caregivers and the sustainability of the human resource involved.

When comparing the health care system with other publicly funded systems we can find several reasons for the increased importance of the sustainability of the health care workforce.

More than any other system, the health care system relies on the quality and the quantity of the workforce. In medical services, almost all of the interventions and actions depend on human interaction and human decision. The staff is the one that has to interact directly with the patient, to assess the gravity of the issue and to decide which services will be provided, when, for how long, where and how. The result of a health intervention depends on the quality of the technical endowment of the clinic and on the knowledge of the practitioner. Health interventions are knowledge based and the human resource is the only one that can guarantee the delivery of adequate procedures to patients [23].

The lack of a well-trained workforce and the imbalances of human resources in a health care system lead to high economic and human costs for the whole country. The performance of a health care system is crucial for the country’s ability to enhance the standard of living of its citizens. But this performance comes from variables like accessibility, efficiency, speed of response, efficacy, and sustainability of the system. In turn those characteristics depend on the knowledge, skills and empathy of the caregivers, on the adequation of the workforce distribution, the working conditions and the sheer number of staff. The impact of a decrease of medical personnel performance can have negative effects on a country’s standard of living that span for tenth of years.

The human resource costs account for the largest expenditure for the health care system. Studies show that in all countries the health expenditure represents a major expense in the gross domestic product, and that depending on the specificity of the country, the wage costs can account to up to 80% of all recurrent health expenditure. In countries where the physical endowment is at low levels and where cutting-edge technologies are not frequently used by practitioners, the wage costs can account for even larger proportion of health care expenditure. The impact on the state budget is even larger because medical staff by prescribing long use drugs can generate additional important costs [24].

All of the above presented reasons enhance the necessity for an enhanced attention to the workforce in the health care system and show the need for an audit of the human resource involved.

Usually inhabitants of developing countries find that access to and quality of medical services are at a lower level than in developed countries. This problem is more stringent for residents of rural areas of the developing countries, where disparities, missing equipment, low financial resources and the poor mix of health care workforce make it even more difficult for them to access quality health services and force inhabitants to incur higher costs for health services.

A performant health care system has at least three determining characteristics [4]: a high level of healthy population; offers superior care to inhabitants; and is a fair system both in regard to patients and to health professionals.
A sustainable health care system has at least the following three characteristics: is affordable for patients; is acceptable by all the key stakeholders; is adaptable to the environment and to changes.

From the human resource point of view a sustainable system is a system that aims to manage the human resource in a sustainable way and to focus on enhancing and strengthening the potential of staff and on better putting to use and exploiting the talent, skills and knowledge of employees. Some of the aims of such a system are the retention of skilled and talented workforce, invest in a long-term improvement of skills and performance of personnel, manage the problem of aging workforce and generate an inclusive culture that nourish and cherish important employees.

When thinking about the sustainability of the health care system in a global context there are some key problems and issues that are related to the human resource involved. Those issues of concern are referring to the size and distribution of the health care workforce, to the country’s capacity to rapidly and effectively train a large number of workers in the related field, the level of economic development and other socio-cultural factors affecting the efficiency of the workforce and lastly to the problem of migration of skilled caregivers [3].

The size and distribution of the health care workforce has a tremendous impact on the key measures of performance and also on the level of sustainability of the whole system. The larger number of medical practitioners and also the number of pharmacists, nurses and other supporting staff is an indicator of a better capacity of the system to provide the necessary amount of services required by those suffering. The number of caregivers must be aligned with the demand for health care services, a value that can change due to socio-economic factors or other events. Also, the number of caregivers has implications for other issues mentioned above. If there is a shortage of trained specialists, the ones remaining are facing a higher degree of work load that will eventually reduce the quality of the medical act, will generate frustration, dissatisfaction and burn-out and lead to an increased migration toward systems that provide a better work-life balance [25].

The issue of health care workforce training is important from the point of view of the training levels and skills of the employees. The more options are there for a practitioner to gain knowledge and to practice, the better trained he will be and he will contribute better to the overall quality of the health care system. As a country can offer a wider range of training options and a better geographical distribution of training centres and medical universities, the easier it will be for the health care system to adapt to new challenges and to fill in the gaps left by migration. Universities provide a whole ecosystem around them, that can help offer lifelong training programs for medical personnel, that can also stimulate research and development in medicine and can create a better climate for knowledge sharing through conferences, publications, workshops and other events. Eventually all of those will lead to a better prepared workforce, a more resilient one and a more adaptable one with beneficial effects on the quality of the services provided.

The third factor taken into consideration when examining the sustainability of the health care system, and especially in developing countries like Romania, is the country’s level of economic development together with other socio-cultural elements like age and distribution of population as well as the population’s education that reflects in the trust towards health care services. The fact that the level of economic development has a direct influence on the amount spent by the government and population on health care services has been demonstrated by numerous studies. The larger the GDP, the more funds are allocated towards the health care system resulting in better endowment, in large scale use of new technology and the most important in a better trained and a larger health workforce. Another implication of lower level of economic development is that it is positively correlated with lower a lower degree of education and with a larger proportion of population living under the extreme poverty level. In turn this translates into a larger proportion of population that does not understand medical services and does not trust health care workers or just does not have access to medical services due to lack of insurance, identity documents or just extreme poverty. Besides poverty that can reduce the demand for health care services, another important factor to consider is the age distribution of population that can drastically increase the demand and the costs of health care.

The last issue regarding the sustainability of the health care system from the point of view of the human resource involved is that of medical doctors’ migration. Migration of highly skilled workers or “brain drain” is a phenomenon that has drawn the attention of a multitude of researchers. Usually brain drain is associated with a loss of welfare of in the source country. The migration of medical doctors was first felt in Europe in the 40’s when doctors migrated to the USA. Nowadays migration of health care personnel is considered by the WHO to be one of the biggest problems that affect emerging and developing countries health care systems and is widely blamed for the lack of staff [11]. The most dimple definition of brain drain is that of the international migration of skilled workers from one country to another [26].
Literature has divided the factors that influence this move into push factors that are related to the country of origin and pull factors that are related to the country of destination [27]. The main push factors that are described in academic works and apply to Romania are: level of payment as the main determinant for migration [28]; professional factors like opportunity of career development [29]; lack of support from the community and better opportunity for the family members or for children [27]; the perception that the destination country has a superior culture system and a better political system [29]. Between the pull reasons we can find better employment opportunities due to the lack of professionals, higher wages and better living conditions [11, 30-31].

When writing about the migration of skilled workers and especially of medical doctors one must analyse the effects, both positive and negative. Usually the donor country observes a higher number of negative effects and the individuals as the receiving country experience a larger share of positive effects. The negative effects are felt by the whole HCS of the source country. Brain drain in the health care system is considered to be more problematic for the source country because the losses are not only economic but also social.

One of the most important effects that can be observed is the shrinkage of the health work force pool. As the government is responsible for offering an accessible health system, the lack of human resource will impair that and will hinder the performance of the system. The shortage of specialists can have effects on multiple quality indicators of the HCS. Studies found that a reduction in the number of doctors is linked to a higher mortality rate for children and to a decrease in vaccination rates [20]. In Romania studies concluded that the mortality rate is directly influenced by migration by the fact that the diseases that have the highest contribution to the increase of the mortality rate are those related to medical specialities that are most affected by doctor’s migration [32]. The reduction in the total number of practitioners can lead to a redistribution of the work load towards the remaining colleagues that in turn will lead to chronic fatigue, burn out, and incentive to leave the work place for a more relaxed one.

A reduction of the health work force can also lead to disruption of medical services if an important specialist decides to leave or if this takes place in remote locations where is hard to find a replacement. This can generate additional costs for population that seek medical services and have to travel long distances to find them. The migration of trainers and professors of medicine also can hinder the transmission of knowledge towards the new generations.

The second negative effect of doctor migration is represented by the financial cost of the investment that the country has made in the training of the leaving workers [33]. Romania faces a higher cost from loss of investment as out of 13 medical universities, 12 are public and the vast majority of students benefit from scholarships from the government. In literature there is an argument that some part of this economic loss is recovered by remittances. Even if Romania has been benefitting from high remittances in the past years our opinion is that in the case of medical doctors remittances represent a small proportion of income due to the fact that usually migration is permanent or due to the fact that medics come from families that afforded to sustain them for 10-12 years in university an residency and do not require help due to above median income levels.

The positive effect of high migration for Romania has been the rise of investment in human capital and training prior to leaving, effect documented for other countries too [34]. Because a large number of doctors left the country and the wage differential is large enough, a large proportion of high school graduates intend to study medicine. This leads to a larger number of med school graduates that can compensate the loss due to migration and can lead to a better selection for the health care system and by universities. A higher wage differential incentivises the students to study harder and be more determined and that leads to better skills for graduates and for the next generation of practitioners. A larger number of university enrolments leads to an increase in quality of the medical act due to a better transmission of knowledge through conferences, workshops and training.

5. Conclusions

The present paper attempts to audit the long-term sustainability of the human resource involved in the health care system by generating a composite index that can be used to easily track the evolution of the system and is easily understandable and easy to communicate.

The most important issues found to impact the human resource sustainability are in order of weights: the financial compensation of medical personnel, the number of graduates from medical universities, the total number of doctors working in the system and lastly the issue of doctor migration.

The evolution of the index of the last three years shows us that the migration problem that has been heavily debated by academics and by the Romanian media, can be managed and compensated by the other factors taken
into consideration. More than that, our findings strengthen the results of previous studies that concluded that the main push factor for doctor’s migration is the wage differential between Romania and the developed countries. We found that a consistent increase in the financial welfare of doctors led to a reversal of trend and to a 45% decline in the number of doctors that choose to leave and work abroad.

We consider that the adoption of measures like an increase of health workers wages together with an increase in the number of admissions to medical universities can strengthen the sustainability of the health care system in Romania. Those two measures together can depress and compensate the loss of skilled doctors due to migration and can lead to an increase in the total number of caregivers that the system can deploy. Such an increase will solve by itself part of the problem of internal migration and will lead through academic channels to an increased quality of the medical act and an upsurge of medical research.

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