

# Consideration(S) of the Consequential Effects of Quality Indicators for Sustainable Development in Health Care Practice and Delivery

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## Abstract

Indicators play a major role in organizing, monitoring, and evaluating quality improvement in health care. They reflect the existing and desired level of service delivery, making it possible to define measures to achieve the desired level, monitoring their implementation and the success of the programme. The idea of the usefulness of accurate indicators in ensuring sustainable development is currently beyond doubt and acts as a paradigm (generally accepted truth) in the ideology of sustainable development. The purpose of this article is to demystify this paradigmatic status and draw attention to the important side effect of their use. It is the phenomenon of an alternative way to improve indicators (AWII) – identifying and using opportunities to improve indicators without improving the quality of medical services. The article discusses the prevalence of this phenomenon, its main types, the dependence of the type AWII on the characteristics of a used quality indicator, their role in distorting the link between quality indicator readings and actual quality, the conditions stimulating the use of AWII, and barriers that oppose its use. A system of measures aimed at the timely prevention of AWII is discussed.

*Keywords.* Health care, medical services, improving the quality of medical services, quality indicators, side effects of indicators

## 1. Introduction

In health care, performance indicators are increasingly used to measure and control the quality and efficiency of care. Indicators play a major role in organizing, monitoring, and evaluating the performance of an individual worker, entire institutions, the entire national health system (Muller 2019). Their role is especially significant in improving the quality of medical services. Indicators reflect their existing and desired quality, aid in clarifying measures to achieve their desired level, allow monitoring the implementation of these measures, the results of their application, the success of the programme as a whole, and its stages (Chen 2009; Justickis *at al.* 2005). Due to the administrative and disciplinary responsibility of the programme participants for the achievement of planned results, as well as in all cases when their remuneration depends on the improvement of performance, the indicators act as a motivator for the implementation of the programme (Kyeremanteng 2019). Indicators are also central to our understanding of how health improvement should be implemented (Milstein & Lee 2007).

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It is considered self-evident that such improvement presupposes, first of all, the creation of appropriate indicators, towards the improvement of which all further activities will be directed (Muller 2019). Therefore, the use of indicators for the management of quality improvement usually does not raise doubts and in fact, acts as a paradigm (generally accepted truth) in the ideology of sustainable development and appears to be beyond criticism (Jurgutis et al, 2011; Kakkar, & Aggarwal, 2019). The purpose of this article is to demystify the paradigmatic status of indicators and draw attention to the phenomenon of “alternative way to improve indicator (AWII)”, when even an impeccable indicator may be ambiguous and associated with a distorted reflection of quality, and quality indicators are improved not by actually improving quality, but by alternative methods that allow improving indicators without actually improving quality. In this article, we will discuss the main types of AWII, the conditions for its occurrence, its negative consequences, and means of prevention. The role of AWII in the difficulties faced by ensuring sustainable improvement in the quality of medical services is discussed.

## 2. The Concept of “Alternative Way to Improve Indicator” (AWII)

The “alternative way of improving indicator” will be discussed in cases where the performer achieves the planned improvement of indicators in an alternative way, that is, one that was not provided for by the programme and which does not provide a real improvement in quality. Thus, a decrease in the mortality rate of patients in a medical institution can be achieved by increasing attention to the most threatening diseases, improving the methods of their treatment. However, the same increase in this indicator can be achieved in an alternative way, using the opportunities to limit the admission of the ill patients, and accelerating their discharge. A decrease in the number of surgical complications can be achieved not only by improving surgical operations, increasing the skill of surgeons, but also by an alternative way of refusing surgery in cases where there is even the slightest possibility of complications.

Reducing the queues of patients in polyclinics should be achieved by identifying the organizational reserves of the institution, increasing the number of doctors working at the reception (Coma *et al.* 2013). However, the same effect can be achieved in an alternative way – by simply reducing the time of the doctor’s appointment. Patient satisfaction and a decrease in the number of complaints can be achieved by actual improvement in the quality of medical services, or perhaps alternatively – through protective medicine measures – prescribing unnecessary drugs, avoiding responsible decisions and difficult cases. In all these cases, an alternative route can improve the indicators of quality, but this will happen without actually improving the quality of medical services.

## 3. The Main Types of Alternative Ways to Improve Indicators (AWII)

1. *First type of AWII. Improvement of indicators due to the deterioration of activities not covered by them.* Any programme aimed at improving the quality of certain services assumes that the quality of all others should not deteriorate. Despite the said, this type of AWII is based precisely on improving the quality indicators of certain activities at the expense of reducing attention to all other areas of activity not covered by the improvement programme. Thus,

the programme for the improvement of the quality of surgical services poses a difficult task for the hospital to find additional resources to improve the equipment of the surgical room, improve the preparation of patients for surgery and improve the qualifications of the surgeons. In this situation the simplest and easiest way to solve the problem is a simple reallocation of existing resources in favour of activities, reflected by indicators.

This alternative way of improving indicators is particularly applicable when the improvement programme is directed to one specific area of activity of a doctor or institution. Here are examples of healthcare quality improvement programmes, each of which had a specific quality improvement aim: reducing mortality and length of stay, reducing patient waiting times, ensuring that treatment complies with national standards, increasing doctors' satisfaction with their work, reducing the number of repeated hospital visits (Hill 2020). In each programme, the aim was to improve a limited group of indicators and the person responsible for the fulfilment of this task was required to find the necessary forces and means, and in each case, it appeared that the simplest way is to do it at the expense of other spheres of activity.

2. *The second type of AWII. Selection of cases that improve indicators.* The contingent to which the quality improvement programme is directed can be very diverse. Therefore, the effect of quality improvement measures can be quite different as well. In some patients, these measures can lead to a rapid improvement in performance. The performance of others may take more time. *The selection of cases that improve indicators* takes advantage of case selection (patients, health care facility) to ensure that the score only covers the population that is most conducive to rapid growth in scores. As mentioned above, a surgeon can quickly improve success rates simply by avoiding cases in which the risk of complications is somewhat increased. The examples of indicators that can be vulnerable to this *AWII* type are indicators based on the decrease of negative outcomes of different medical procedures, for example, obstetrical complications, wound infections, acute myocardial infarction after major surgery, gastrointestinal haemorrhage or ulceration after major surgery, urinary tract infection after major surgery, etc. (Definitions of Quality Indicators, Version 1.3 2012). In all these cases, it is at the discretion of the physician to apply or not to apply a risky procedure to the patient. In each such case, the physician is required to establish the level of reasonable risk at which it is advisable to perform such a procedure. The desire to minimize the rate of unfavourable outcomes encourages the doctor to reduce the level of acceptable risk to a minimum and, at the slightest risk, not carry out the procedure, even if the level of risk is much less than reasonable.

3. *The third type of AWII. Improving indicators by re-coding cases that worsen them.* The disease, its dynamics, the impact of therapeutic measures on it, the results of treatment, as a rule, depend on an immense number of complexly interrelated factors. In a significant part of cases, it is impossible to unambiguously establish the causes of adverse changes in the patient's condition, complications and treatment failures. This creates the opportunity to choose the explanations that most contribute to the rapid improvement in the quality of treatment. Thus, one of the most frequent indicators of the quality of surgery is the mortality of patients after surgery due to complications over the next 30 days. The logic of this indicator is obvious. The more successful the surgical intervention, the less likely it is that there will be a complication causing the death of the patient. Therefore, we can assume that an improvement in this indicator – a decrease in inpatient mortality after

surgery, most likely reflects an improvement in the quality of surgeries. However, the death of the operated patient can be caused by other reasons, for example, an exacerbation of one of the comorbidities the patient has (parallel diseases). To decide whether the underlying cause of a patient's death is substandard surgery or comorbidities, the physician must determine the extent to which each person is influenced by his underlying disease or comorbidities. The need to improve the success rate can have a significant impact on this assessment, prompting the clinician to overestimate the role of the comorbid (Department of Health and Human Services 2007).

*4. Fourth type of AWII. Reduction of medical services.* Programmes to improve the quality of health care services often include certain activities aimed at the improvement. That is, informing patients about the possibilities of participating in disease prevention programmes, conducting classes with doctors or patients, assisting in the acquisition of certain skills, participation of doctors in scientific work, etc. Quality indicators in this case record the very fact that this activity was carried out and reflect the number of interviews, classes, the number of people covered, etc. (American Diabetes Association 2020). However, they do not reflect the content of these events. Thus, a programme for the improvement of the quality of care for patients with diabetes may include an increase in the number of periodic conversations between a doctor and a patient with diabetes. Such a conversation can be very brief and formal, or deep, driven by the doctor's sincere desire to tell the patient everything he needs to know for successful treatment. The first method is preferable from the point of view of the rapid improvement of the indicator. The brevity and formalism of the conversation allow the doctor to conduct a greater number of such conversations, which will be reflected in his increased indicator. Likewise, it is easier and simpler to achieve an increase in the number of doctors participating in training sessions, if such sessions do not provide for the actual assimilation of knowledge but focus on the social programme.

All of the above-mentioned facilitate the improvement of indicators, although it may not result in an actual quality improvement. The most vulnerable to this type of *AWII* are indicators that reflect the number of certain actions but do not control their content.

#### **4. Conditions for the Occurrence of AWII**

*1. Possibility and availability of AWII for the performer.* The main condition for the emergence of *AWII* is, firstly, the very ability to achieve an improvement in indicators through actions that, although is not improving the quality, yet is improving its indicators. The more indirect is the indicator, the more distant are its relationship with the result of medical services – improvement of the patient's health, the easier it is to use *AWII*.

*2. Application of AWII requires less effort than actual quality improvement.* Avoiding a difficult and risky case often requires only a slight adjustment of emphasis when discussing the issue of the surgery. This is incomparably easier than the long and difficult work to improve the qualifications of surgeons, improve their working conditions, and provide them with all the necessary equipment. It is much easier to reduce patient complaints by “defensive medicine” by prescribing unnecessary drugs and unnecessary examinations and avoiding responsible decisions than by actually improving the quality of diagnosis and treatment. It is much easier to complete the conversation, necessary for a quality indicator of work, with

a person with diabetes limited to 2-3 phrases than to devote time and energy to it. The greater the gain in time and effort the AWII promises and the busier the doctor is, the more precious is each minute to him, the stronger the temptation to provide the necessary improvement in quality indicators using AWII methods. In contrast, the “alternative” phenomenon does not occur if the measures of actual quality improvement are simple enough and need minimal time and effort (Pronovost 2006).

3. *Insufficient effectiveness of methods of actual quality improvement.* Measures for the improvement of the quality of health services must be effective to achieve their aim, that is, actually able to cause the necessary changes. Otherwise, the most vigorous implementation of these measures will not lead to an improvement in performance. Concurrently, studies of the effectiveness of quality improvement projects show that insufficient effectiveness of the quality improvement measures outlined in the programme is a common phenomenon (Hill 2020). This is particularly the case if changes in indicators depend on various extraneous factors not related to the programme and, therefore, beyond the control of the programme executors. In this case, the executors of the programme find themselves in a difficult position.

For example, the quality of the work of an individual institution or a local health care system is often judged by the health indicators of the served contingent (such as child and adult mortality, life expectancy, etc.).

However, in reality, these indicators only to a small extent depend on the efforts of workers and institutions, whose activities they must evaluate (Muller 2019). The main role has such factors as the lifestyle of the population and its changes, the state of the environment, and changes in the demographic situation. Therefore, the requirement to improve these indicators puts the healthcare institutions in a difficult position and AWII appears to be the only means to meet these requirements.

4. *Administrative and/or financial pressures.* When a medical institution participates in a nationwide reform for the improvement of the quality of medical services is tasked to achieve a certain improvement in the corresponding indicators within a certain period, the responsibility of its employees and, above all, of the management, for fulfilling this requirement arises. The higher this responsibility, the stricter the requirement to achieve their planned improvement by all means, the stronger the temptation to do it in a simpler and easier alternative way. In the same way, if the income of an institution depends on the increases in indicators, then the stronger this dependence, the stronger the motive to use an alternative way of improving indicators. Therefore, the stronger the administrative pressure or financial incentives that force the employee to improve indicators, the stronger the pressure to use the simpler, faster, and easier way to do it, namely the use of AWII. The same increase in revenues without the use of AWII would require both a long time and a lot of effort from the institution and would postpone such an increase in revenues in the indefinite future. All that can cause a paradoxical phenomenon – the opposite effect of measures aimed at improving the quality. Increased administrative or financial requirements to improve quality indicators may lead not to an increase, but, on the contrary, to stagnation of the current level or even a decrease in quality.

5. *Ability to carry out AWII rather covertly.* (“This is perfectly legal, but it is better that only those know, who need to know”). In most cases, alternative ways to improve indicators are not illegal. Most often, the surgeon has the discretion of whether to operate on a

particular patient. Likewise, the doctor on duty at the hospital has the right to decide where the patient will be served better – in his hospital or some other. However, in a significant part of cases, this decision is not transparent, since it is based on a complex and rather subjective weighing of the most diverse arguments, the course of which is known only to the doctor who makes the decision. The opacity of this solution makes it possible to use this opacity to select the patients most conducive to improving quality indicators. As a result, the “backstage” where the indicators are calculated is hidden from those most interested in the actual improvement of the quality. For example, patients with a vital interest in making quality improvement real are not able to detect a doctor’s use of AWII.

## 5. Motivational and Ethical Barriers of “Alternative Indicator Improvement”

In all cases, when the prerequisites arise that the goals of the reform will be achieved in an alternative way, the question arises regarding the barriers, that is, the forces that should prevent it. Several possible barriers to the manifestation of an alternative option shall be considered.

*Barrier 1. Altruistic motivation of the doctor and other health care workers.* Some doctors love their work, sincerely sympathize with the patient and want to help him, consider their work as the most important thing in their life. Often, they are driven by religion (helping others) and other altruistic motives. The reform aimed at improving patient care cannot but win their approval and support. These motives can become one of the barriers preventing the emergence and strengthening of AWII for the improvement of indicators. Such a doctor will not select only the simple cases for surgery or limit the explanation to the patient in a few sentences. However, this puts such a doctor in a difficult and ambiguous position. The indicators of the doctor or institution that chooses the easier alternative to improve the indicator is naturally better. Therefore, an altruistic physician who, instead of improving indicators, seeks to help the patient and achieve a real improvement in quality, has worse indicator scores than his colleague using an AWII (McGaghie 2002). The consequences of this are illustrated by the results of studies that show how indicators destroy the intrinsic motivation of doctors by replacing it with an external one, which strengthens the desire to increase external indicators (Fernandez -Kelly 2011)

*Barrier 2. Moral barriers.* Quality improvement programmes are conducted to improve quality, not to create the appearance of improvement. Therefore, the use of AWII to improve indicators can be poorly consistent with the moral ideas of a conscientious, honest doctor and create moral problems for him. This can function as a barrier to prevent them from pursuing AWII to improve indicators. However, as is well known from psychological research, the conflict between a moral norm and a strong motivation aimed at violating it triggers defense mechanisms aimed at weakening this conflict (Costello 2010). This can be a mechanism of psychological rationalization (“Everyone does this. Therefore, this is correct”), an appeal to more important obligations (“I cannot let the team down!”), acceptance of the role of a passive victim, completely dependent on the circumstances (“I am forced to use AWII!”). Pressure on moral norms leads to the activation of these mechanisms, the gradual “erosion” of moral ideas, and the weakening of their restraining force. Besides, the technical issues must be mentioned as well. Technological progress impacts the quality system more often. Artificial intelligence

technologies in healthcare nowadays can provide opportunities to use technologies that not just improve the quality but create moral barriers due to ethical issues (Leimanis & Palkova 2021; Raudys & Justickis 2003).

## **6. Administrative and Legal Barriers Against “Alternative Indicator Improvement”**

Monitoring the progress, intermediate and final results of the programme for improving the quality of medical services is an important element of its implementation. The health care system has an advanced control system. These are various types of audits, reporting, and inspection systems. To what extent is the administrative control system capable of identifying the phenomenon of an alternative way of improving the indicator, assessing the degree of its impact on the actual quality, and counteracting it? Studies of the effectiveness of various forms of control over any activity (including quality improvement control) have revealed many a range of factors that determine its effectiveness (Vukadinovic 2015). In the case of controlling the occurrence of AWII, the ability to detect this phenomenon may largely depend on the attitude of the controlling authority towards it. It is important to what extent the controllers and authorities are interested in the actual improvement of quality, and not only in improving indicators. The predominant interest of the controlling authorities in the indicators may arise if these authorities are somehow responsible for the success of the improvement programme, and this success is determined based on the growth of the indicators approved by them (Slavinska, Grigoroviča, Palkova 2021). This interest of the regulatory authority in recognizing the project as a success creates their tolerance for AWII, a tendency to take on faith the performance improvement, and ignore the evidence that this improvement is obtained in an alternative way (Denes 2015). Thus, on the one hand, the use of alternative options for improving indicators is faced with barriers that prevent their use. However, on the other hand, the ability of these barriers to counteract the alternative option is limited and associated with certain negative consequences that weaken these barriers (erosion of moral norms, negative consequences for those who refuse to use AWII).

## **7. Discussion**

On the one hand health care quality indicators are used as a source of management efficiency. But, on the other hand, this application also generates side effects that can weaken or distort its action. AWII is one of such side effects. Therefore, the reaction to AWII should be the same as to any other means, which can be undoubtedly useful and effective and at the same time might have undesirable side effects. Due to their usefulness and effectiveness, quality indicators deserve further application. However, the described side effects must be considered and prevented. This means that health system development programmes should also include a system of measures aimed at identifying and preventing AWII.

This also means that if we are not convinced that the use of the indicator is reliably protected from the effects of AWII, it affects the true changes in health care. We have no right to trust the indicators, use them to track the success of measures to improve health care, and develop further measures based on them.

Using indicators without testing them against AWII is nothing more than self-deception. In this case, the indicators acts as a screen that hides the actual state of health care both from physicians and the general public.

Indicators that are not protected from AWII do not detect healthcare problems, but hide them. They do not contribute to development of healthcare but inhibit it.

Studying AWII and ensuring that any indicators are protected is therefore a high priority for ensuring sustainable healthcare development.

## 8. Case Study

As we said above an important prerequisite for using AWII is the ability to do it stealthily. This latent manifestation of AWII significantly limits the possibility of its direct identification and study (for example, during an interview or questionnaire survey). It is difficult to expect that a surgeon who operates only simple cases and thus ensures himself a low level of complications will tell the researcher about this. Likewise, the director of a healthcare facility that has easily reduced patient queues by shortening doctor visits will also try to hide this.

Therefore, as in the case of other hidden phenomena (corruption, latent offenses), indirect data plays the main role in identifying and studying AWII.

In the case of AWII the indicators can be divided in five stages.

First stage (*Establishing the most likely AWII type when applying an indicator*) At this stage we should establish whether there is a way to easily and quickly improve this indicator without actually improving the quality and which AWII can do it. For example, can a surgeon seeking to improve the success rates of his surgery sorts out patients who could impair his success rate.

Second stage (*Establishment of conditions stimulating the use of AWII*). At this stage we must identify the factors that stimulate the doctor or other healthcare providers to take advantage of this opportunity.

Third stage (*Barriers against "alternative indicator improvement"*). At this stage it is necessary to establish psychological, moral and legal barriers that deter the use of AWII.

Stage four. (*Evaluation of the ratio of factors that stimulate the doctor to use FFF and factors that restrain him from doing so*). If we establish that the latter outweigh, we can conclude that this indicator is reliably protected from AWII and will show a true change in quality.

Fifth stage (*Development of measures to prevent AWII*). If at the previous stage we found that the incentives pushing the doctor to use AWII are stronger than the barriers that keep him from it, it is necessary to find out whether it is possible to change this ratio and what measures will help to do this.

Until all the above steps have been taken and it has not been proven that the indicator is reliably protected from AWII, we have no reason to believe that this indicator reflects a true change in quality.

Let's consider all this in a specific case. It is patient safety indicators recommended by the European Union Commission.

In 2006, the Committee of Ministers and The Council of Europe made several recommendations regarding patient safety (The Council of Europe, 2006). One recommendation was to develop reliable and valid indicators of the safety of care. Based

on these recommendations the project 'Safety Improvement for Patients in Europe' sets out to develop a toolbox for the safety of care presenting a variety of tools for development, surveillance and monitoring of the safety of care and patient safety activities (European Commission, 2006). It was recommended to develop a set of indicators that reflect the safety of patients from medical errors and other violations of the quality of care. Let us consider to what extent these indicators are protected from the effects of AWII. The established maximum size of the article does not make it possible to analyze all the indicators recommended by them. Following this, we will restrict ourselves to the first ten indicators (out of 28). As mentioned the first step to testing the indicator's security against AWII is to establish whether there exist a way to easily and quickly improve this indicator without actually improving the quality and which AWII able to do it. Let's consider the recommended indicators from this point of view.

### **1. Measuring hospital standardized mortality rates**

Reducing mortality is an important task of a health care institution and the inclusion of this indicator in the number of recommended ones is quite justified. At the same time, as shown in section "3. *The main types of alternative ways to improve indicators (AWII)*" cases, the use of indicators, based on the decrease of negative outcomes of different medical procedures (for example, obstetrical complications, wound infections, etc.) creates the possibility of a quick and easy improvement in the indicator through a tendentious selection of cases (*Second type of AWII. Selection of cases that improve indicators*). In the case of mortality, it is avoiding hospitalization of the most severe cases as well as their expedited discharge so that death does not occur in the hospital.

### **2. Transition of care—patients' understanding of the purpose of their medication**

Modern patient-centered treatment requires the patient to understand its goals and methods. Therefore, the validity of including this indicator among the recommended is beyond doubt.

At the same time, the concept of "understanding" is a so-called "fuzzy concept" (Mohan, 2018) which means that there is no way to unambiguously define its boundaries. "Understanding" can be broadly defined as the result of a detailed explanation to the patient of the goals and methods of his treatment or it can be narrowly defined as a "yes" in his medical documents placed near the statement "The goals and methods of treatment have been explained to me."

The Fourth type of AWII (*Reduction of medical services*) takes advantage of such difficulties in setting the boundaries of such a fuzzy concept. It creates the opportunity to easily and quickly improve such an indicator by narrowing its boundaries as much as possible and thereby ensuring an increase in the number of patients who can be recognized as understanding the treatment.

### **3. Institution-wide use of cultural assessment.**

This indicator is very important in today's multicultural healthcare. However, "cultural assessment" is also a fuzzy concept. Therefore everything that has been said before about the patient's understanding of his treatment applies to him. This stat can be improved quickly and easily using the fourth type of AWII.

### **4. Surveying the development of the patient safety culture.**

The terms "patient safety", "patient safety culture", "development" and "surveying" are very broad in it's scope. Institutions and individuals applying this indicator are given ample

opportunity to refine it. Such clarification on the one hand is necessary to adapt the indicator to the specifics of the country and institution. However, on the other hand it opens up the possibility of tendential filling of the concept only with such content that will ensure the rapid growth of the indicator, even if in reality the dynamics of the cultural assessment is completely different (*fourth type of AWII*).

### **5. Hospital-acquired infection registration—post-operative wound infections**

Surgery and post-operative care must ensure sterility and if infection (for any reason) does occur, immediate detection and response. Therefore, the inclusion of this indicator among the recommended ones is quite understandable. However, the desire to increase this indicator creates an incentive "not to notice" the beginning infectious inflammation, in the hope that it will go away on its own and will not spoil the indicator (*The third type of AWII. Improving indicators by re-coding cases that worsen them.*)

### **6. Ventilator pneumonia**

Artificial ventilation is one of the most important means of compensating for patients' respiratory failure. However, its use is associated with some possible side effects (Chang, D. Mechanical Ventilation. Fourth Edition. 2014). Therefore, it is contraindicated as its use in cases where it is still possible to do without it and non-use in cases where it is necessary. However, an indicator such as the number of cases where a ventilator has been applied encourages the physician to refrain from using the ventilator even in cases where the need is quite high. In this case the doctor indeed improves the indicator using the third type of AWII and does this at the expense of a deterioration in the real quality of treatment.

### **7. Hand hygiene—measured by alcohol consumption.**

Hand washing is an important means of preventing infections and the value of this indicator is beyond doubt. However, a physician can easily and quickly increase this indicator by paying attention not to clean hands, but possibly more use of detergent. (*Fourth type of AWII. Reduction of medical services*)

### **8. Theme-related patient safety indicators: 'surgical complications'**

As in the case of the fifth indicator (Postoperative wound infections) a quick and easy improvement in this important indicator can be ensured by maximizing every opportunity to not recognize as complications as many cases as possible. (*Third type of AWII. Improving indicators by re-coding cases that worsen them.*)

### **9. Complications of anaesthesia**

As in the previous case the indicator can be easily and quickly improved by taking advantage of every opportunity not to recognize the given case as a complication. (*Third type of AWII. Improving indicators by re-coding cases that worsen them.*)

### **10. Post-operative sepsis**

The indicator can also be improved by taking advantage of every opportunity to avoid admitting complications. (*Third type of AWII. Improving indicators by re-coding cases that worsen them.*)

So, we have established that each of the considered indicators is vulnerable to one or another type of AWII. This means that in order to be able to trust these indicators and rely on them all other stages of checking the protection of indicators from AWII must be performed. Therefore, with each of them, it is necessary to assess the intensity of incentives pushing the use of AWII and the strength of the barriers preventing it.

As indicated above, until this ratio is identified and evaluated there is no reason to believe

that when applied this indicator will be protected from AWII and will reflect an actual change in quality.

The question of AWII has not been raised previously including when developing the indicators, we have considered, recommended for use in the countries of the European Union. The vulnerability assessment of the recommended indicators was not included in the safety improvement for patients in Europe (European Commission, 2006, 42) applied during their development. So, they have not been tested for their resistance to AWII. In accordance with this we cannot be sure that these indicators reflect real trends in healthcare and can give correct information about the extent to which healthcare trends correspond to our ideas about its sustainable development.

## 9. Conclusions

In conducting the study, the authors draw several conclusions. Firstly, the authors identified that AWII can function as a weakening and distorting factor for improving the quality of health services. Besides, the type of possible AWII depends on the characteristics of the applied indicator. Considering this dependence when choosing an indicator which makes it possible to predict the AWII, important to make this indicator accompanied by mentioned above. Secondly, the manifestation and severity of AWII depend on several conditions such as the availability of an appropriate AWII for persons implementing the quality improvement programme, the simplicity and ease of its implementation, the level of motivational pressure on persons implementing quality improvement measures, the ability to ensure sufficient secrecy of the AWII. Thirdly, the authors strongly believe that the ability to stop an already formed AWII depends on the presence and strength of the barriers preventing the manifestation of AWII: the internal interest of doctors and other health workers in the actual improvement of the quality of their work, the strength of moral standards, and the peculiarities of administrative control.

*Limitations and possible future researches.* In this article we tried to give a general description of AWII and its most important manifestations. However, the research framework did not allow quantifying the prevalence of this phenomenon and its impact on sustainable health development as well as assessing the degree of effectiveness of the AWII countermeasures described in the article. All this can be the subject of further research. It can be assumed that further studies of AWII will follow the same path as the study of other hidden phenomena, such as corruption, latent crime, medical errors, etc.

The first step in such research can be the development of complex indicators that make it possible to quantify AWII based on a set of its indirect signs. This will form the basis for further broad representative studies of the prevalence and causation of this phenomenon.

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