The Evolving Disease Patterns and New Tracers to Assess the 21st Century Health Care

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ABSTRACT

It goes without saying that we are in a new era of diseases. The target of disease for healthcare service has now shifted from infectious diseases to chronic degenerative diseases, and the target age group has shifted from children to the elderly. The tools used to assess the quality of health care services now need to be revised and tailored to the new target groups and their health issues. The tracer, one of these tools, is reviewed and potential new tracers are proposed in this manuscript. All tools used to assess both healthcare services and population health status should receive a similar updated intervention.

Keywords

Evolution, Transition, Civilisation diseases, Quality healthcare, Tracer.

Introduction

Most stakeholders in health systems agree that now we have entered a new era of disease [1]. On one side, healthcare professions are moving towards providing more services to at least apparently healthy people in the post-reproductive period of their lives [2]; on the other side, they are moving towards preventable pandemics of "new" chronic illnesses [3]. These new health issues are attributed to our inability to adapt to consumption-based and sedentary lifestyle, or to man-made factors such as lack of exercise and dreadful diets [4].

Omran published the transition theory in 1971, which we know from its applications in the disciplines of demography and epidemiology [5]. The term refers to the transition from a society with a relatively stagnant population in which high death and birth rates stabilize each other into a society with low death and birth rates, first with a decrease in deaths and then births [5]. Morbidity and mortality models have also shifted from acute infectious factors to chronic and non-infectious factors during this transition [5].

The demographic transition suggests a downward trend of high mortality in the eighteenth [6] and nineteenth centuries [7] was primarily due to declining living conditions and poverty-related mortality [6,7]. Epidemiologic transition refers the transition from short-lived but recurring and unpredictable epidemics that spread and recede quickly, bringing large number of deaths in a short period of time, into the era of health conditions whose presence is constantly felt, progresses slowly, and lasts for long time [8].

Material and Method

Thus, the tools used to assess the quality of health care services now need to be revised and tailored to the new target groups and their health issues. For this purpose, following a comprehensive screening of the published articles relating the subject, the articles which were considered to be significant by the author were chosen and analyzed.

Patient and public involvement statement

Patients or public were not involved in this work or in the design of this work. No patients involved in the recruitment to and conduct of the study; since there is no study participants. This not a randomised controlled trial, therefore the burden of the intervention is not assessed by patients themselves.

Results
Evolution and "new" civilisation diseases
In the Western world, there has been an alarming increase in cardiovascular diseases, type 2 diabetes and some cancers since 1960's; these diseases continue to climb rapidly up among the causes of mortality and morbidity [9]. Rising life expectancy has also paved the way for these diseases, resulting in an ageing population [10]. Factors such as a high-calorie diet rich in salt and fat, tobacco abuse and sedentary lifestyles are common in affluent industrialized societies, but unusual in traditional cultures that maintain the lifestyle of pre-agricultural humans from which the modern human genome was selected [11].

The clinical manifestations of cancer, atherosclerosis, insulin-independent diabetes mellitus, and other similar diseases are all associated with advancing age [12]. The changing age distribution of the population must of course have made a contribution, but the fact that the early stages of these chronic diseases are not seen in young people living in traditional cultures, as opposed to young people living in Western countries, suggests that age is not the primary determinant [12]. Moreover, those living in traditional societies remain thin and normotensive, with no signs of coronary atherosclerosis after the age of 60 [13].

Assessing the New Health Care Provision and New Health Status Using Tracers
The rising in the prevalence of chronic degenerative diseases around the world has necessitated the development of new tools to disclose the differences between healthcare providing services [14]. To ensure access to appropriate healthcare services in both medical and economic sense, viable healthcare service quality assessment methods that could be used at diverse levels of health care and in the community should be developed [15]. However, we do not yet have any widely accepted healthcare service assessment tools that cover a broad range of health conditions. A health service that fails to integrate the necessary components for the management of these health problems will not adequately respond to patients' needs. The definition of health care quality can be made by reversing this situation [16].

Is it possible to use any health condition in men or women of any age group as a tracer? To be considered a tracer, a health condition must meet the following 6 criteria : 1) the tracer condition should be affected by service providers'efforts; 2) it should be easily diagnosable and have a specific case definition; 3) its prevalence should be high enough to be found in sufficient numbers even in small populations; 4) it should be sensitive to the practices of the health team, and its frequency and distribution should be modifiable by at least one of these practices; 5) at least one of the preventive, diagnostic or therapeutic interventions should be well established; 6) and the non-medical factors influencing its distribution in the community should also be well known [17]. Two prerequisites must be met before using the tracer method. First, well-kept systematic records must be available, and second, treatment criteria for the health condition under investigation must be agreed upon [17].

Discussion
The weakness of this tool is that each service unit can choose a different tracer condition, with the consequence that the information may not be integrated at the decision level. Despite this weakness, such a start should be encouraged, and primary care teams should be directed to develop measurement tools that can be compiled into a single list over time. If the selected health condition and the service provided in that condition are well selected, it can provide insight into the overall state of health care.

Classical Tracer Examples
Kessner proposed 6 health conditions [17], which were later used as tracers: middle ear infections and hearing losses; visual disorders; iron deficiency anemia; urinary tract infections; hypertension; and cervical cancers [17]. The first four of these could be used to assess the quality of childhood health care; while the last two for adulthood. Cervical cancers is more appropriate for the women's late reproductive period, wheras hypertention can be used for the post-reproductive period for both genders. As it can be seen, in the 1970s, post-reproductive period health status and health care were only represented by hypertention, whereas childhood health was represented by 4 conditions, implying that health status of the younger segment of population was mainly occupied health services and policy. Although hypertention had not yet reached its current prevalence, it appears to have preoccupied health care in those days as well.

Proposed "new" tracers
Type 2 diabetes may be an appropriate suggestion for the fifth stage of epidemiologic transition we are currently experiencing, and it can be used to assess the impact of health care [14]. Diabetes is well defined, fairly easy to diagnose, and prevalent implying that it meets the tracer conditions proposed by Kessner [18]: it is easily affected by health care activities. It is easy to diagnose and has a specific case definition. Its prevalence is high and continues to rise [19]. It is sensitive to health interventions, which can alter its prevalence and distribution. Preventive, diagnostic and therapeutic interventions are well known [20]. Non-medical causes such as obesity, family history, age and diet have been identified as influencing its distribution in the community [21]. Indeed, even only the presence of diabetes, as wel as uncontrolled type 2 diabetes with complications, may be enough to judge that preventive health care is inadequate [21].

Osteoporosis with fracture is a good example of the fifth stage epidemiologic transition, indicating that the condition is not screened in the community [22]. Ospeoporosis primarily indicates community health level, whereas cases presenting with fracture should indicate a deficiency in health care. Essentially, any osteoporosis case that is not diagnosed, monitored and treated should be regarded as a fracture risk. Osteoporosis can be controlled with health interventions; it is easy to diagnose, and the case definition is known [23]. Its prevalence rises as the average age of the population rises, but prevention of osteoporosis should begin at a young age, i.e. it should be screened in every community [23]. The preventive, diagnostic and therapeutic activities of

osteoporosis are well known; the prevalence and distribution can be modified by preventive health care interventions [24]. Non-medical factors affecting its distribution, such as diet, sedentary lifestyle and veiling of girl children, are well known [25].

Colorectal cancer is typically a disease of the 50+ age group and cases diagnosed at grade III-IV should indicate a lack of preventive health care. This condition can be a useful tool in evaluating health care. Colorectal cancer has a good prognosis in people over the age of 50 when detected early through scopy screening [26]. Pathological diagnosis and case definition are accurate owing to the techniques of biopsy and surgical removal of the cancerous colon segments [27]. Because its prevalence is rising among elderly populations, targeted screenig in nursing homes may be more cost-effective [28]. The mortality, but not morbidity, of colorectal cancers can be changed in frequency and distribution through health care interventions [29]. To conclude, colorectal cancer mortality is preventable, diagnosis is relatively easy and accurate, surgical, radiologic and drug treatments are well known, and risk factors such as diet and genetics that influence the distribution of colorectal cancers are well established [27].

Lung cancer is a rapidly spreading condition in both men and women populations, and its diagnosis at stages III & IV should indicate a lack of health promotion activities such as screening and smoking cessation, making it a good tracer for health care quality assessment. If we review the necessary conditions for this condition, we can see that the diagnosis of the disease is highly dependent on the efforts of the service providers, that the diagnosis is easy and that the case definition is clear [30]. Its prevalence increases in older age groups and among smokers; anti-smoking campaigns seem to influence the prevalence and distribution of the disease, so lung cancers can be considered sensitive to the practices of the health care team; as a result, the impact of preventive interventions is unquestionable [31]. Diagnostic screening tests (x-rays, biopsy) have high sensitivity and specificity, and highly effective treatments are available [32]. At least one non-medical cause, smoking, is well known to influence the distribution of this disease. Furthermore, atmospheric pollution and working conditions can be counted among risk factors [33].

Breast cancers can be a tracer condition that accurately indicates the quality of health care preventive programs, particularly in cases with no mammography/ultrasound/MRI (MUM) history. Breast cancer is a disease that can be diagnosed early and treated; hence it is affected by health care [34]. MUM screening and biopsy were used to diagnose and define cases based on specific criteria. Its prevalence is increasing in women over the age of 50 in the Western world [35]. Screening can change morbidity and mortality; genetic screening and lifestyle counseling can reduce morbidity [36]. Much progress has been made in both diagnosis and treatment; factors, both genetic and almost entirely lifestyle factors, determining disease distribution have been identified [37].

Disabilitating rheumatoid arthritis is a preventable condition; its diagnosis based on clinical judgment is considered easy and case

definitions have been made, but the clinical course of rheumatoid arthritis (RA) is heterogeneous with a range of onset ages, number of joints involved, and severity of symptoms also vary. Its prevalence increases especially in women over 60 years of age and RA is the most common form of inflammatory polyarthritis, with an overall prevalence of up to 1%. Patients benefit from rehabilitation and disability due to this condition can be prevented [38]. Although the disease itself is not easy to prevent, its diagnosis is accurate and anti-rheumatic drug therapy largely prevents or reduces joint damage and disability. Medication can manage patient's DALY and exercise improve QALY [39]. Non-medical causes of this condition are not well recognized, but women, smokers, and those with a family history are more commonly affected [40].

Chronic depression may be a good candidate for health care services utilization assessment. It is a condition that can be treated by a dual therapy-medicalization intervention of the health care team [41]. It may not be easy to diagnose, but the case definition has been established; actual prevalence measurements can yield very diverse results, but depression is most likely to be a common condition in the community [41]. Its prevalence and distribution depend on diagnosis through specific approaches such as home-based screening and family history; once diagnosed, it is a treatable condition with close follow-up [42]. Depression is a condition that is heavily dependent on environmental conditions, making it difficult to prevent, and its diagnosis depends on special inquiries, but there are enough weapons available for its treatment [40]. Its distribution in the community is mostly due to non-medical causes and an intersectoral approach is required to recognize it [43].

Prostate cancers with no prostate specific antigen (PSA) testing history may be recommended as tracers: This type of cancer is sensitive to healthcare interventions. Its diagnosis is based on PSA screening and biopsy and case definition based on pathology is specific [44]. Prostate cancer is the most commonly diagnosed cancer type in the US after skin cancer and the second leading cause of cancer death in men [45]. Prevalence increases with increasing age, with a higher prevalence among people of African descent in the US population. Mortality due to the disease can be reduced through screening programs [45]. Including men with a family history in screening programs after the age of 50 may be considered an important preventive intervention [46]. Biopsy is the definitive diagnostic method, surgery and drug treatment are well known [43]. Prostate cancer has two known non-medical causes; it is more common in African American men and the majority of cases have a family history. Thus, racial and genetic causes are obvious, which may allow targeting of screening programs [45].

MRSA is now a condition that has become a major problem for healthcare teams and policy, and despite the best efforts of the health service, it is a condition with high mortality; it causes more deaths than all road traffic accidents [47]. Its diagnosis is precise and has a specific case definition; its prevalence appears to increase with the size of the hospital [47]. Unfortunately, its prognosis is not sensitive to the efforts of the healthcare team. Its prevalence and

distribution could theoretically be altered, but we are still a long way to run [48]. Although the ways of prevention are known, it is difficult to prevent, and treatment is often impossible despite easy diagnosis [48]. Non-medical factors influencing its distribution are not well known; adherence to hygenic procedures, especially by hospital medical staff, is an important precaution.

Conclusions

The new tracers proposed here do not mean that the classical ones are outdated, even though the slice of the population occupied by children is shrinking, they will always exist [49]. Second, some of these conditions may be more useful in assessing healthcare service; wheras others may be more useful in assessing the population health status. The use of these two types of tools together, and thus an assessment of both healthcare service and community health level, may yield more valid results for an effective evaluation. Similar tools used for health care quality assessment, such as "sentinel health events" [50], "pairs" [51], and "trajectory method" [52], should be reviewed with the same optic.

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