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Gender-specific medicine and personalised medicine: health economics profiles

Francesco Saverio Mennini

Research Director Economic Evaluation and HTA (EEHTA) CEIS, University of Rome "Tor Vergata", Italy
Institute of Leadership and Management in Health, Kingston University – Rome, London, UK

Health is very important for all of us, and virtually no-one is prepared to sacrifice it in the way we are prepared to sacrifice other things in daily life. However, most of us do take a risk where health risks are concerned. Evidently, we accept a slightly smaller probability of being healthy in exchange for a benefit (which may not even be that great). Evidently, we make trade-offs even when the chance of being healthy is at stake.

So, health is important for the wellbeing of individuals and society, but a healthy population is also a prerequisite for a country's economic productivity and prosperity.

Consequently, guaranteeing a healthcare model that allows appropriate and rapid access to effective treatments is an essential prerequisite for system efficiency, from the economic standpoint as well. Equally, providing effective treatments allows people's quality of life to be improved significantly and this is also reflected positively in terms of improved productivity and positive impact on a country's general economic system.

Undoubtedly, budget constraints exist in all health systems and these require decision-makers to combine access to innovative and effective therapies with resources that are certainly not unlimited, if System sustainability is to be assured.

As far as Italy is concerned, despite the many efforts in recent years, spending continues to be inefficient. Public health service financing is certainly not high (compared to the main European countries, also in terms of GDP per capita spending, we are a very long way behind – public health spending is 6.5% of GDP), and this makes sustainability issues even more acute.

When spending is inefficient it is inadvisable to reduce spending further or make cuts (often linear). It is better to identify the expenditure items where spending can be improved and, above all, where costs can be reduced (both direct and indirect), also through new care and treatment management models.

In an era where "personalised" treatments targeted at well-defined types of patients are being used increasingly, a new branch of biomedical research, such as gender-specific medicine, may and indeed must represent a new perspective for the future of health as well as for effective healthcare management.

In fact, gender-specific medicine examines the links between belonging to a sexual gender and the efficacy of therapies in treating certain pathologies. Its proposed objective is to ensure that every individual receives the appropriate treatment.

A targeted approach to ensure that every individual, male and female, is assured prescription appropriateness accompanied by early patient management, allows the health system to reduce costs, on the one hand (the use of targeted therapies ensures better use of resources) and, on the other, thanks to improved adherence to therapies, to also generate savings (better adherence to therapies produces real savings. For example: a reduction in prescription errors, safety of drug treatments and appropriateness of treatment).

So, the pre-selection of patients who may better respond to therapies may avoid pointless expenditure, allocating the resources saved to the treatment of other important pathologies.

An orientation of this type would provide major advantages for citizens/patients in terms of rapid access to appropriate treatments/therapies accompanied by improved life quality (see introduction of biomarkers). Yet, certain therapies may be effective only if certain traits exist. So, managing to select patients before they undergo treatment, through simple diagnostic tests (for example: the mutational genetic characteristics of the tumour), would improve the intervention's level of efficacy and reduce costs and waste as a result.

In certain pathologies a different gender-dependent response to treatments is identified. All the studies, such as for multiple sclerosis, indicate that males and females respond differently.

Women respond better in relation to outcome, disability and progression of the illness, whilst men respond better in terms of the reduced number of relapses. As a result, the care and treatments should/may be targeted considering these differences in response. This offers the option for patients not to be put through treatments that, due to their genetic profile, would be ineffective and thus provide them with prompt therapy more suited to their own traits, with a greater likelihood of response.

So, care organisation and management that takes account of gender-differences and a personalised medi-

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cine approach could provide financial and economic benefits for the National Health Service accompanied by, and also the result of, greater adherence to therapies.

In fact, better adherence to therapies produces real savings (for example: reduction of prescription errors, safety of drug treatments and therapeutic appropriateness). Pre-selecting patients who may respond to therapies could avoid needless expenditure and the saved resources could be allocated to the treatment of other important illnesses.

All the above factors require a major change in outlook both by decision-makers and the scientific world and by patients, both at macro and micro level.

At micro level, in particular, the need is felt for a new approach that takes the therapeutic pathways into account. Obviously, we are not referring to the classic therapeutic pathways, but rather to correct and approved therapeutic pathways that can better achieve a balance between "scarce" resources and the availability of innovations. These, by definition, entail incremental costs but also incremental benefits (efficacy), taking account of the fact that every pathway has to be organised with reference to the gender difference of the patients considered.

In fact, patients must be assured the most effective care pathway with the best technologies available, based on the patient's specific traits, so that action is taken in the early stages of the pathology so as to prevent complications, thus avoiding the associated direct and social costs.

Yet, a gender medicine approach means that the silos budget approach must be abandoned. In fact, it would be very difficult, if not impossible, to argue for gender medicine and at the same time assess the impact of using a technology only in a specific spending sector without assessing the effects on other components of the treatment pathway and of the system (and these do not consider the effects on social and welfare spending that is very high in our country).

In essence, we have to change the paradigm that to date has marked the decision-maker's approach, both national and regional, towards health, where health is considered as the cost for the community and for the welfare system overall. In actual fact, health and, with it, healthcare are not a cost but an investment, both for the welfare system and for the country's economic system overall.

To avoid and reduce the consequences of the current scenario to a minimum and, at the same time, enable the pursuit of the goal of a gradual but rapid introduction of gender medicine, more appropriate prescriptions accompanied by a rapid access to innovative therapies* would reduce the costs incurred by the health and welfare system overall and would lead to a considerable improvement in the efficacy of interventions.

So, success in designing care pathways and access to timely treatments (accompanied by precise stratification of patients based on their distinctive traits, including gender) could reduce direct costs and welfare expenditure, without forgetting the fundamental goal of improving patients' state of health.

Correspondence to
Franco Saverio Mennini
Facoltà di Economia
Università degli Studi di Roma "Tor Vergata"
Via Columbia 2
00133 Roma, Italy
email f.mennini@uniroma2.it

* In Europe, for example, Italy is the country with the longest delay in accessing innovative technologies (Russo P, Mennini FS, Siviero PD, Rasi G. Time to market and patient access to new oncology products in Italy: a multistep pathway from European context to regional health care providers. Ann Oncol 2010; 10: 2081-7).