

# Avoidable blindness and value based healthcare: more value with a population approach

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The main challenge for all healthcare systems today is to meet people increasing health needs, through the efficient resources allocation and the creation of value for the individual and the community [1, 2]. This challenge manifests itself in multiple scenarios such as that of low vision and blindness whose load of disability are constantly increasing. Vision impairment and blindness impose physical, social and quality-of-life limitations on individuals affected, but also a significant economic burden on society due to expenditures on healthcare treatment, productivity losses, costs of providing formal and informal care, and lost wellbeing [3]. The World Health Organization (WHO) estimates that 80% of all causes of visual impairment are preventable or curable using cost-effective interventions. Then blindness and eye disease should be considered a public health priority and cost-effective interventions should be promoted to reduce the burden on individuals and society. WHO estimates that there are 285 million people visually impaired, of which 39 million are blind [4]. The two main causes of visual impairment in the world are uncorrected refractive errors (42%) and cataract (33%). Other causes primarily age-related are Glaucoma, Diabetic Retinopathy (DR) and Age-related Macular Degeneration (AMD). These diseases are more frequent among people older than 50 years of age [4]. It is important to understand the magnitude and causes of visual impairment and trends over time because this information is crucial for resource allocation,

planning and developing synergies for better healthcare programmes. Therefore physicians should increasingly be able to contribute to the management of diseases with greater impact on society such as those of low vision and blindness, by overcoming the logic attached to the single performance and projecting into a population based approach. The aim of this approach is to maximize value and equity by focusing not on institutions, specialties or technologies but on the population with a common need, defined by a symptom or a condition - such as AMD - or a common characteristic such as being frail [5].

In this context, achieving high value for patients must become the overarching goal of healthcare delivery. If value improves, economic sustainability of the healthcare system increases.

Value is defined as the health outcomes achieved for the patients relative to the cost of achieving those outcomes [6]. According to M. Porter, the value equation has at the numerator the clinical outcomes and at the denominator the total cost. The numerator is specific for each condition and it depends on the clinical and scientific knowledge of the moment. The denominator refers to the total costs of the full cycle of care for the patient's medical condition, not the cost of individual services [1]. The transformation to a high-value healthcare delivery system must come from within, with physicians and provider organizations taking the lead. But every stakeholder has a role to play in improving the value of care [6].

In the same years, the concept of value was exploited also in Europe by Sir Muir Gray who proposes a paradigm shift in the way we look at value linking strictly the value-based medicine to the approach of population medicine [7]. Gray et al. propose a population approach also to improve value in eye care [8]. According to the authors, from a population perspective, a new approach in eye care is required, led by clinicians who have the knowledge of diseases and the evidence base of treatments. Value needs to be applied to the whole pathway of eye care encompassing raising awareness, prevention, screening and early detection and treatment. Therefore the main changes include: engaging clinical teams and the public to redesign pathways of eye care; move from institutions to integrated clinical networks; move to programme budgeting; move to being judged on clinical outcomes; move towards prevention and early detection [8].

This is particularly important in Europe where publicly-funded health systems need to foster equity whilst working efficiently. The legacy of the financial crisis will not be mitigated quickly and there is an urgent need to transform the threat of budget cuts into an opportunity to scale-up performance. Reforms and the application of value based policies are urgently needed. Italy represents a perfect case-study to explore in order to advocate for reforms. It has a long-established publicly-funded health system, accounting for more than 75% of the total national healthcare expenditure [10]. Ensuring equal access to uniform levels of health services whilst controlling health spending is one of the inspiring principles of the health system. Therefore, the Italian Ministry of Health defined a package of essential health services to be provided to all its citizens. However, over the past years, inequities increased and are nowadays clearly manifested. Striking examples are provided by the adoption of cancer screenings and vaccination policies across the regions. Such policies have been not uniformly activated nationwide, leading to massive internal inequities. The result being that Italy has one of the best public healthcare systems in the world, guaranteeing universal health coverage, which only applies to a part of population [9]. Unfortunately, inequity remains a major problem in eye care services also in Italy where there are 362 thousand blind people and more than 1 million with low vision [11].

Recently, an Italian project - *Value of Blindness Care* - has been concluded. This project had the objective to study, in the light of Value-based Medicine, the processes crossing the ideal pathway of low vision/preventable blindness management - with particular attention to AMD -, as well as spread the culture of integrating the skills of public health and clinical medicine into the community of ophthalmologists. A retrospective observational analysis was conducted using the data extracted from the health information flows of an Italian region (Friuli Venezia Giulia) and for the years 2007-2016. Subsequently, an in-depth analysis was conducted on hospital admissions data, access to Emergency Room and outpatient services of

2016, with particular attention to patients with AMD. For data extraction the *International Classification of Diseases*, 9<sup>th</sup> Revision (ICD9) codes related to ocular pathologies - Cataract, Glaucoma, DR, Diabetic Macular Edema and AMD - and their ticket exemption codes have been selected.

The project involved a panel of experts from different disciplines so that the expertise of clinical leaders was complemented by the perspective of public health, forensic medicine, healthcare and risk management, decision making and health economics.

The results of the analysis confirmed that the most common ocular pathologies are cataracts and glaucoma. The average age at diagnosis was 69.8 years, and female gender was most affected by these diseases (55.55%) (Figure 1).

A relevant issue was the presence of multiple ocular pathologies in the same patient, with a prevalence of cataract. The analysis of regional data also allowed to describe a real-world scenario useful to understand the main difficulties present in the governance of AMD, characterized by an important variability in the diagnostic-therapeutic pathway of its patients (Figure 2).

There was also a real problem of coding the pathologies as well as limitations of traceability of data through regional administrative flows.

This study aimed to provide data on the management of patients with low vision/blindness diseases, with particular attention to AMD, especially in relation to the increased incidence of this pathology associated with population aging and its current management difficulties (e.g. delay in diagnosis that causes delay in starting a treatment, lack of integration of services, etc.) and its related costs. Through this analysis, it was possible to identify the main critical areas that need to be built on "system capacity" such as: the current epidemiological gap, at national level, on the clinical burden of avoidable blindness; the difficulty in mapping the pathway of eye care through the data coming from regional clinical/administrative information systems; the unwarranted variation and the variability in the diagnostic-therapeutic management of patients with AMD. AMD imposes a high socio-economic burden on its patients and society. Research advances have improved our knowledge of this pathology, but there are still major critical issues in managing these patients.

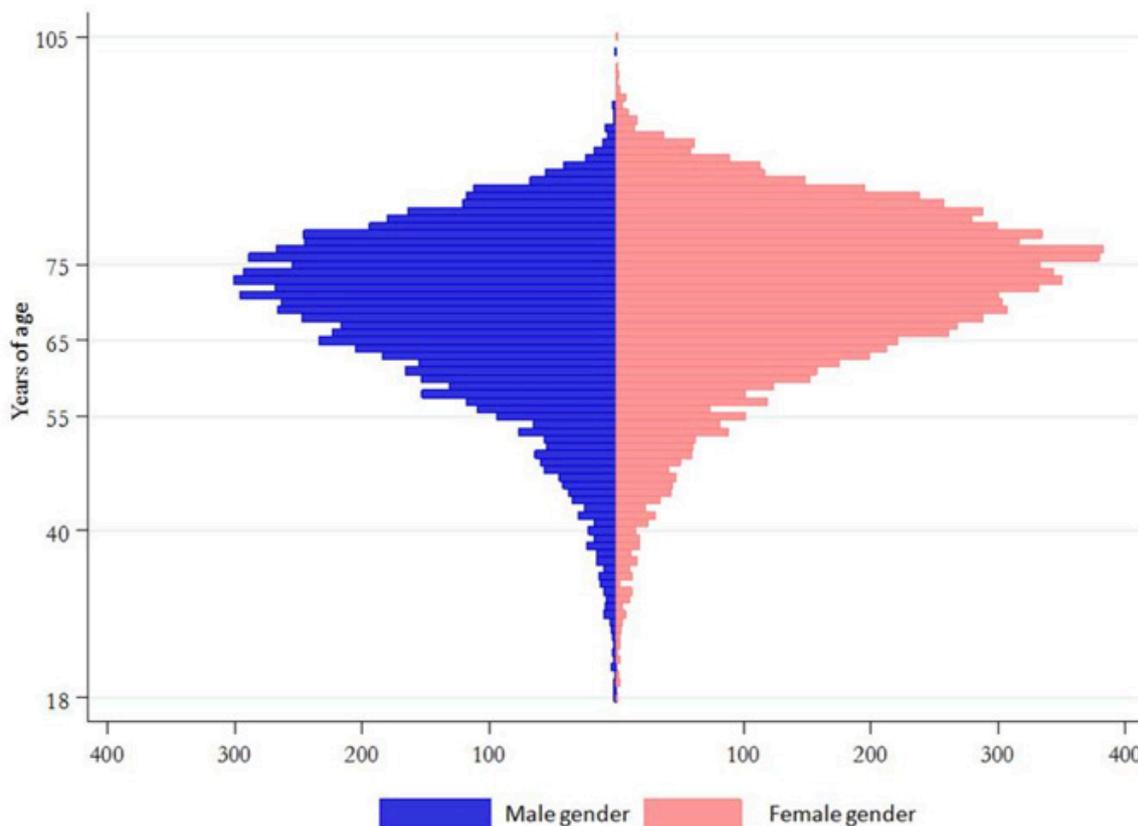
Improving quality and value in care is a priority objective to be achieved in all healthcare systems, especially in complex areas such as visual impairment. This challenge requires a governance based on systems, networks and pathways approach [2]: with this approach, a better quality of healthcare can be guaranteed based on both clinical and organizational appropriateness. Therefore, it will be necessary to identify a systems-based programming to ensure the universality of the right to healthcare and the economic sustainability of the Italian National Health Service.

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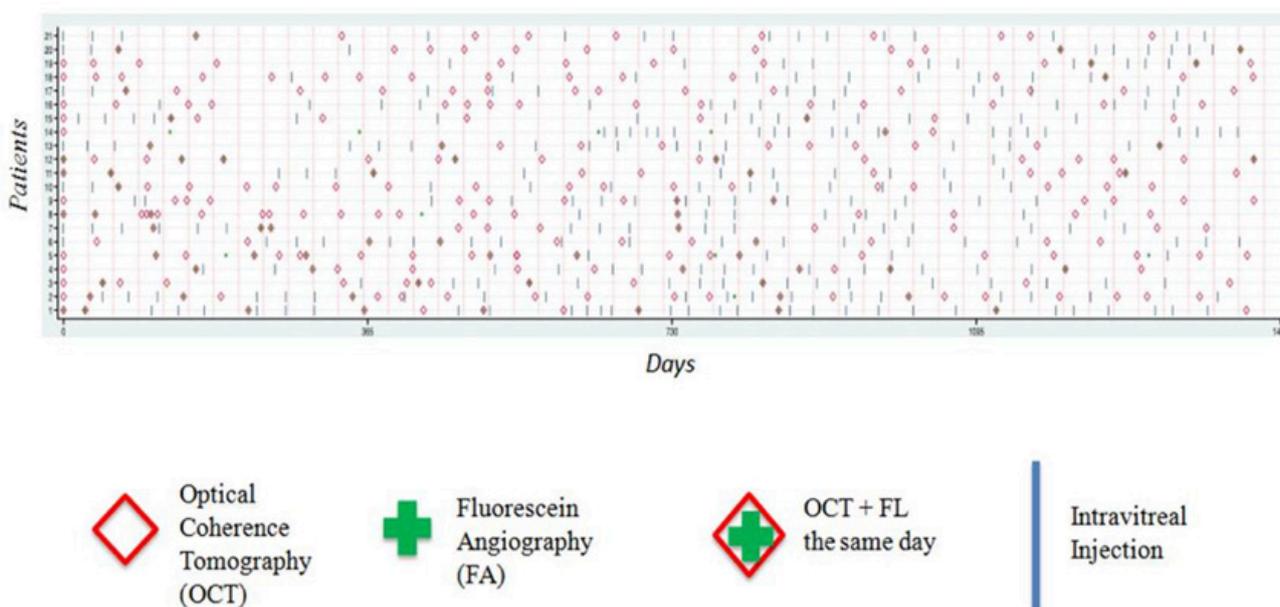
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**FIGURE 1. Cohort 2007-2016, Friuli Venezia Giulia Region: distribution by age and gender at diagnosis**



**FIGURE 2. Diagnostic therapeutic pathway of patients with AMD in the years 2013-2016.**



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