

Imbalance between supply and need of medical oncologists in Belgium

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Medical oncology was officially recognised as a specialty in Belgium in 2007. Only limited information is available as to the optimal number of medical oncologists to cover present and future needs. The objective of this study was to analyse the current and future supply, need and demand of medical oncologists in Belgium.

Two surveys were conducted to analyse the supply and need of medical oncologists, one among medical oncologists and a second among medical hospital directors. The evolution of demand due to demographic changes was forecast for the next two decades. A current shortage of medical oncologists, corresponding to roughly half of the current medical oncology workload, has been estimated and is mostly the result of a recent recognition of the specialty and the consequent reorganisation of hospitals. An increase of 28% in the demand during the next two decades is forecast because of an expanding and largely aging population. A worrisome imbalance between supply and need of medical oncologists in Belgium shows itself and an increased demand is forecast, mainly due to demographic changes. This analysis is only the first step of a more general assessment of the situation needed to identify the challenges of medical oncology as a new specialty and to address the multi-faceted issues associated with treating cancer in the future.

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Introduction

Although cancer is an ancient disease, probably as old as humanity itself, successful treatments are a recent phenomenon. Loco-regional treatments – surgery followed by radiotherapy – were the first treatments available. More recently, systemic treatment of the disease has been developed, and medical oncology refers to this modality.

Medical oncology was first recognised as a subspecialty by the American Board of Internal Medicine in 1973 and in some European countries in the 1980s and 1990s.¹ In March 2011, the European Commission announced the inclusion of medical

oncology among the professional qualifications covered by the European Union (EU) Directive 2005/36/EC, resulting in the official recognition of medical oncology throughout the EU.²

In Belgium, the recognition criteria for medical oncology were published in October 2007 in a ministerial decree.³ The official Belgian recognition of the discipline defined both the competence area and the educational and professional criteria to be fulfilled by a physician in order to qualify as a medical oncologist. The competence area includes systemic treatments of cancer in patients at least sixteen years old, knowledge of the physiopathology of the different

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types of cancer, and knowledge of their diagnosis, prognosis and predictive factors of response to treatment. The training requirement is three years of specialisation in internal medicine and three years in medical oncology.

With the legal framework established, new medical oncology departments are being organised in many Belgian hospitals. However, only limited information is available as to the optimal number of medical oncologists to cover present needs. The general feeling of a shortage of specialists in medical oncology, reflected by the multiple vacant positions, has never been quantified. Projections for the future are urgently needed since the number of patients newly diagnosed with cancer is expected to increase because of population growth and aging. Moreover, the number of cancer survivors is expected to increase, as survival time for patients with cancer has lengthened through earlier diagnosis and improved treatment. Medical oncologists will play a pivotal role in providing care for many of these patients.

In this article, we report our analysis of three aspects of the medical oncology situation in Belgium:

- (1) the supply of medical oncologists, analysed through a survey sent to medical oncologists;
- (2) the need for medical oncologists, analysed through a survey sent to medical hospital directors;
- (3) the evolution of the demand, during the next two decades, based on the projected increase of the incidence of cancer, taking the demographic changes into account.

Our ultimate objective was to analyse the current supply, need and demand for medical oncologists in Belgium and to forecast the supply and demand of the next two decades.

Methods

The concepts of supply, need and demand have been used according to the definitions provided by Jeffers et al.⁴ Our analysis of the supply, need and demand for medical oncologists combines data obtained from three sources:

1. Medical oncologist supply

In August 2009, a survey was sent by mail to 161 practising medical oncologists in Belgium. The survey was sent through the Belgian Society of Medical Oncology (BSMO). Among the 161 surveys posted,

six came back because of address changes, and 103 responses (66%) were received within a six-week period. Nine answers were excluded from further analysis for the following reasons: the physicians were retired (four), currently working in a foreign country (two), or from another specialty (three). Ninety-four answers were analysed in total.

Medical oncologists were asked to evaluate their work time in number of hours and half days of work per week. For the analysis, physicians working nine and ten half days a week were pooled as full-time equivalent (FTE); those working seven and eight half days a week were pooled as 4/5 FTE; and those working five and six half days a week were pooled as 3/5 FTE.

2. Medical oncologist need

In December 2010, a second survey was sent, by mail, to 114 medical hospital directors. This survey was sent through the BSMO as well. All hospitals taking care of adult patients were selected for this survey even if they did not have a medical oncology department at the time of the survey. Only psychiatric and children's hospitals were excluded. Among the 114 surveys sent to medical directors, 32 answers (28%) were received within a three-month period.

3. Evolution of the demand according to demographic changes

The evolution of the number of cancer cases during the next two decades due to demographic changes has been calculated by multiplying the incidence rate with the population projections for the years 2020 and 2030. The population projections used were those made by the Belgian Federal Office of Demographics.⁵ The incidence rate by age was calculated by dividing the annual number of new cases by the population of the same year. The number of new cases was obtained from the Belgian National Cancer Registry.⁶ The incidence rates were calculated for the years 2004 to 2008. The median incidence observed during that period was kept constant to calculate the forecast in 2020 and 2030. All invasive cancers in patients at least 15 years old, excluding non-melanoma skin cancers, were used to calculate cancer incidence.

Statistical analysis

Baseline characteristics of the supply, need and

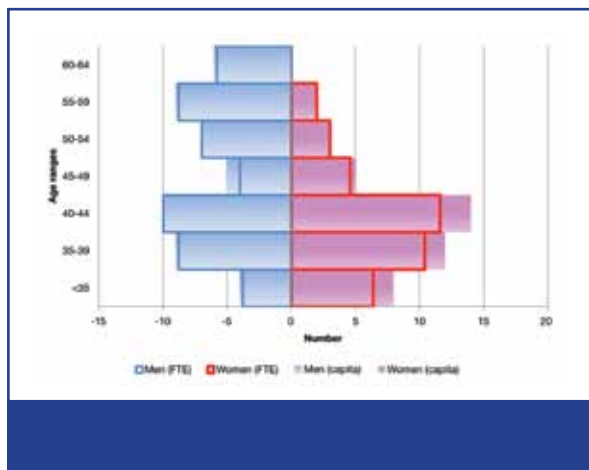


Figure 1. Age pyramid of medical oncologists per capita and per full-time equivalent (FTE). (n=94, Belgium, 2009).

demand were summarised with medians and ranges for continuous variables because of the non-normal distribution and counts (percentages) for categorical variables. The Mann-Whitney test was used to compare medians; a Bonferroni correction was applied to the p-value when multiple comparisons were made. The χ^2 -test was performed to assess the distribution of categorical variables. All statistical tests were two-sided at the 5% significance level. Statistical analyses were performed using IBM SPSS Statistics 20 software.

The aging index has been used to calculate the replacement need of medical oncologists and the population demographic changes in 2020 and 2030.⁷

Results

1. Medical oncologist supply

The demographic characteristics of the 94 responding medical oncologists are shown in *Figure 1*. Among responders, 18.1% are 55 years of age or older and 46.8% are female. In the population younger than 55, there are five times more female oncologists than in the over 55 cohort ($p=0.001$).

The total workforce of the sample represents 86.2 FTE. The global characteristics of medical oncology activity are detailed in *Table 1*. Full-time workers declared working a median of 49.5 hours a week, calls excluded (range: 36 - 66). Gender had a significant impact on the number of working hours per week ($p<0.001$). Men worked more than women both in terms of number of half days of work and in number of hours per half day. The work time of

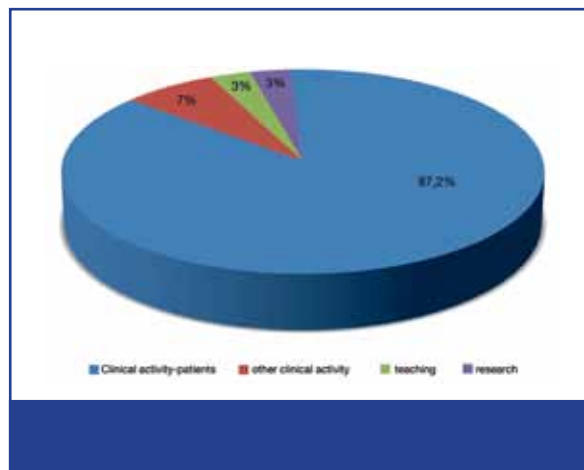


Figure 2. Distribution of the work time of the medical oncologists between their activities. Details on each activity are given in the results.

women is 80.3% of that of the men, and the number of patients seen by women is 81.3% of the number seen by men.

The professional activities of the sample were distributed as shown in *Figure 2*: 87% of the work time of medical oncologists was dedicated to direct patient care (including the related administrative tasks); 7% was dedicated to general patient care, e.g. participation in multidisciplinary oncological consultations or membership in a local ethics committee; 3% was dedicated to teaching medical students or nurses; and 3% was dedicated to clinical or basic research. In the next ten years, 16.6 FTE of the sample will have to be replaced because of retirement. Knowing that the survey sample represents 94 medical oncologists while there were 173 recognised medical oncologists in Belgium in 2009, we can extrapolate

Table 1. Characteristics of the activity of medical oncologists (Belgium, 2009, n= 94)

	n	%	Med	range	p
Proportion of women					
among <55 y old		54.5			0.001
among ≥55 y old		11.8			
Workload in FTE					
1 FTE	65		49.5	36 - 66	<0.001
4/5 FTE	18		40	32 - 45	
3/5 FTE	8		31.5	24 - 36	
Number of patients seen per week					
Women	40		32.5	8 - 65	0.004
Men	44		40	15 - 100	

to the whole Belgian medical oncology population as follows: assuming that the gender and age distribution for the whole population is the same as in the sample, considering that women have an 80% activity level of that of men and that 54.5% of medical oncologists under 55 are female, the number of medical oncologists needed to replace those who will retire in the next ten years is 30.6 FTE, or 34 medical oncologists.

Considering the aging index of the medical oncologist population, the number of FTE for the next twenty years would be 64.8 FTE or 74 medical oncologists. To replace the current work supply, four medical oncologists should be trained each year for the next twenty years.

When asked about the future, 94.4 % of the sample expressed the intention to remain professionally active for the next five years. The four oncologists who indicated that they would stop their activity were 62 to 64 years old.

Ninety percent of the medical oncologists surveyed were willing to stay in Belgium. Seventy-four percent of the medical oncologists indicated that they shared their medical oncology activity with other specialists. Eighty-eight percent of them anticipated a change in such practice-sharing in the next five years.

2. Medical oncologist need

The details of the 32 answers received from medical hospital directors are shown in *Table 2*. Among the sample of hospitals that answered the survey, a median of two medical oncologists were employed per hospital. In 65.6 % of these hospitals, there was at least one vacant position (1 FTE) for a medical oncologist. The median number of vacant positions in the sample was one, representing half of the current workforce. In 63% of the cases, this position had been vacant for at least one year. Despite this declared shortage, only 12.5% of the hospitals employed medical oncologists trained in foreign countries. The median workload of foreign medical oncologists in those hospitals is 1 FTE. Medical oncologists are in training in one quarter of the 32 hospitals responding to the survey. The median delay before the first visit of a new patient is five days, with a maximum of 90 days.

3. Evolution of the demand due to demographic changes

The demographic projections predict a growing

Table 2. Current workforce of medical oncologists in 32 hospitals and demand (Belgium 2010).

	n	%	Med	range
Number of medical oncologists/hospital (FTE)	32		2	0 - 14.5
Open position in the hospital	32			
yes		65.6		
no		34.4		
Number of open positions in FTE	20		1	0.2 - 2
Duration of the vacancy	19			
less than 1 month		5.3		
1 - 6 months		10.5		
>6 months to 1 year		21.1		
>1 year		63.2		
Foreseen increase in the demand	31			
yes		90.3		
no		9.7		
Estimation of the FTE needed	26		1	0.5 - 5
Medical oncologists trained in other countries	32			
yes		12.5		
no		87.5		
Number of medical oncologists trained in other countries/hospital (FTE)	3		1	1 - 1.6
Presence of medical oncologists in training and their number	32			
yes		25	1	1-7
no		75		
Delay before first visit for a new patient (in days)	32		5	0 - 90

and aging population in Belgium in the next two decades.⁵ In 2010, the Belgian population was 10,087,396. With a predicted growth of 6.8% between 2010 and 2020, the 2020 population will be over 11 million. Similarly, the growth predicted between 2010 and 2030 is forecast at 10.9%. The aging index was 17.2% in 2010 and is predicted to increase by 2% in 2020 and by 5.5% in 2030. This means that 1 in 5 people will be at least 65 years old in 2020 and 1 in 4 in 2030.

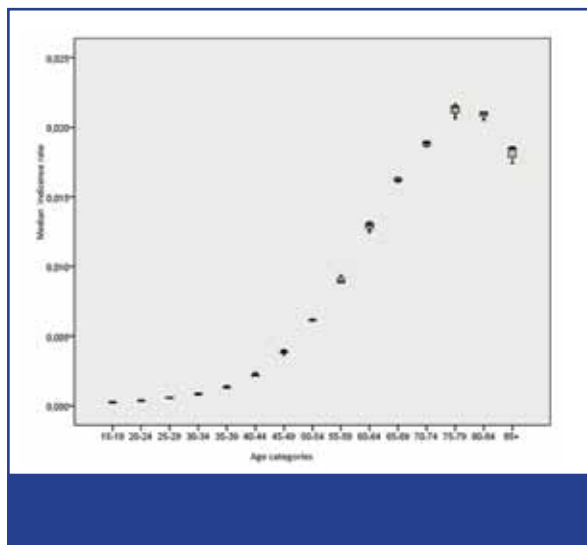


Figure 3. Median incidence rate of non-paediatric invasive tumours, excluding non-melanoma skin tumours, according to age, in Belgium (2004-2008).

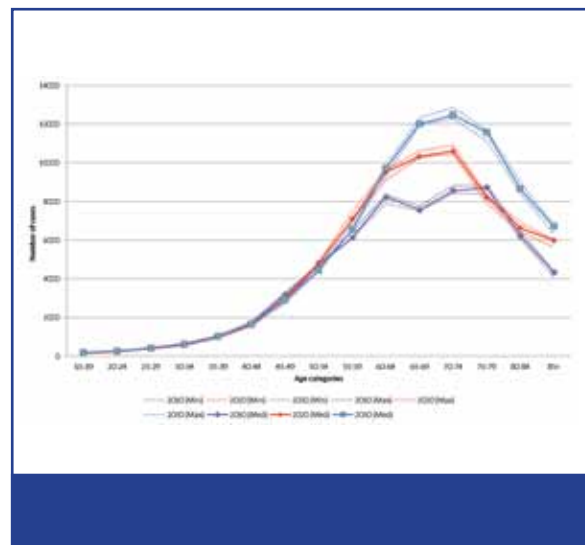


Figure 4. Median incidence rate of non-paediatric invasive tumours, excluding non-melanoma skin tumours, according to age, in Belgium (2004-2008).

Because of the growing and aging population, the number of cancer cases will increase in the next two decades. As described in the Belgian Cancer Registry, the median incidence of cancer is less than 1% before the age of 60 and reaches 2.1% in the population aged 75 to 79.⁶ Figure 3 illustrates the median incidence rate of invasive cancers in Belgium calculated for 2004 through 2008 according to age. The total number of new cancer cases between 2010 and 2030 has been calculated according to demographic projections for the next two decades, with the hypothesis of stable cancer incidence per age category (Figure 4). The total number of non-paediatric invasive cancers will increase by 13.7% and 28.2% in 2020 and 2030 respectively, when compared to 2010. It is important to note that the number of cancer cases in the population aged at least 65 will increase by 17.9% and 45.2% in 2020 and 2030 respectively, because of an increase of this population category. If the number of medical oncologists currently available is considered as the baseline, the number of additional medical oncologists needed to administer care to this growing population of cancer patients would be twelve supplementary FTE between 2010 and 2020 and 24 supplementary FTE between 2010 and 2030. This would require training three more oncologists each year to meet the increased demand due to demographic changes between 2010 and 2030.

Discussion

The work presented here is a first analysis of the supply, need and demand of medical oncologists in Belgium based on data available in 2009 and 2010. To put our work in context, it is important to recall that the medical oncology speciality has only been recently recognised in Belgium and is still in transition. Many internal diseases specialists, haematologists, radiotherapists, gastroenterologists, pneumologists, and gynaecologists are still responsible for the systemic treatment of cancer patients, even administering chemotherapy. This component of the workforce has not been analysed because it is undergoing rapid evolution and decreasing progressively. The surveys collected data only from recognised medical oncologists.

The reorganisation occurring within hospitals, in particular the creation of new medical oncology departments related to the recent official recognition of medical oncology, is probably the main reason for the current shortage of medical oncologists in the 32 hospitals that answered the survey. This shortage is reflected by the high rate of vacant positions. In our limited survey, the shortage is estimated to equal roughly half of the current medical oncology workload. A more robust evaluation of the demand for medical oncologists would have been based on the number of visits to oncologists or the number of prescriptions of oncological treatment. However, this was not possible

at the time of the survey because medical oncologists used the same prescription identification number as internal diseases specialists in the social security system and hence their work could not be quantified separately from that of the other internal diseases specialists. A specific identification number for medical oncologists has been issued since then. However, despite this methodological limit, the survey revealed a significant shortage within the new specialty, which is as expected considering its recent recognition.

In the coming years, the proportion of medical oncologists among all physicians administering systemic care to cancer patients will increase. The acceptable delay of five days before the first visit of a new patient, despite this shortage, probably reflects the still high participation of other specialists in medical oncology rather than a sufficient number of medical oncologists. During the transition period – while other specialists withdraw from the domain and as medical oncology positions are being filled – it will be a real challenge to keep the delay before first visit to its current level.

The medical oncologist population is evolving as shown by the age pyramid (*Figure 1*), with an increasing preponderance of women in the specialty that is similar to the global feminisation of medicine. This might result in a reduction of the supply of workers during the next decades since women spend less time on professional work than men. The changing attitude in younger physicians, who place increased importance on balancing their professional and private lives, as well as new legislation such as the European Working Time Directive, may exacerbate this reduction in the workforce.⁸

Most of the work time of medical oncologists is dedicated to patient care, either directly or indirectly, through the participation in multidisciplinary oncological consultations and ethical committees. In our survey, a very low proportion of work time is dedicated to teaching and research, which may be an underestimation. In other words, medical oncologists involved in research may have felt less addressed by the survey's clinical focus and hence responded proportionately less. However, the degree of this bias cannot be evaluated.

Nevertheless, even if we could adjust for such bias, the participation in basic and clinical research does appear to be very low when one considers that research is essential for improving the outcome of

cancer treatment. If research is led only by pharmaceutical companies, many questions without any commercial impact, but essential to patients' well-being, will never be addressed. A greater involvement of medical oncologists in research and the development of more academic trials are two of the challenges for this new specialty. Clearly both a surprising and important conclusion of our survey, this apparent deficit must be addressed with an active strategy to increase the interest in and opportunities for clinical research by young medical oncologists.

In the next two decades, projections show an increase in the number of cancer cases, due to both an expanding and an aging population. The increase of new invasive cancers in the non-paediatric population is estimated at 14% in 2020 and 28% in 2030. The most important increase is observed in the population over 65 years of age, in which the cancer incidence is estimated to reach 40% in 2030. This important global increase, especially in the elderly population, will increase the demand for medical oncologists and, more acutely, of medical oncologists dedicated to the geriatric population. The growing proportion of elderly cancer patients might in turn change the kind of human resources required: more fragile patients with higher co-morbidity rates may result in more social and other non-medical demands, as well as more hospitalisations in conventional or palliative units.

Similarly, if the prognosis of many cancers continues to improve, which we hope and expect, the better survival rates observed will increase the length of treatment and the number of cancer survivors in follow-up. These increases have not been quantified in our survey model but will inevitably contribute to a higher demand in medical oncology services in the coming decades.

Belgium does not stand alone. A shortage of medical oncologists is noticeable or forecast in several countries where this problem has been analysed. The shortage is mainly the consequence of an insufficient increase in the supply of medical oncologists when compared to the increase in demand. A large comprehensive analysis in United States published in 2007 forecast a shortage of roughly one-third of the work supply in 2020.⁹⁻¹¹ Similarly, even if it has not been quantified, the number of oncologists will not be sufficient to meet future demand in France and in the United Kingdom.¹²⁻¹⁴

Key messages for clinical practice

1. The current shortage of medical oncologists in Belgium is estimated to equal roughly half of the current workload. It is most probably mainly due to the recent recognition of the specialty.
2. An increase in the number of cancer cases is projected in the future, due to both an expanding and an aging population. This increase during the next two decades is estimated at 14% in 2020 and 28% in 2030 in Belgium. A similar increase is forecast in the occidental world. A more dramatic increase is expected in the world mainly due to societal and economic changes with a reduction in other causes of death such as infections and behavioural changes.
3. The challenge will be to convince more young physicians to choose medical oncology as a specialty and to better organise our work, through improved sharing of non-medical tasks with non-medical practitioners, better collaboration with general practitioners and other imaginative solutions.

The analysis of the medical oncologist need, demand and supply is a very difficult task, and our model is limited because it is based on a rough evaluation of those parameters through two national surveys instead of a real quantification of the medical acts carried out by medical oncologists. Despite these methodological limits and a number of unknown parameters – such as future knowledge and technologies whose effect on demand is impossible to quantify today – our analysis indicates that the current shortage in medical oncologists will increase in the next two decades because of demographic changes.

Conclusion

Our work suggests that the current shortage of medical oncologists in Belgium is mainly the result of the recent recognition of medical oncology as a specialty and the reorganisation of many departments and hospitals as a consequence of this. The shortage is clearly expressed by a high number of vacant positions, estimated at half of the current workforce.

Several factors are relevant with regard to medical oncologists in the future. The specialty's feminisation, and an emphasis of the younger generation of physicians on work-life balance, will modify the supply of medical oncologists and will require a higher replacement rate than the current one.

Moreover, demographic changes are expected to have a significant impact on future demand. The projected increase of the number of new cancer cases has been calculated at 28% between 2010 and 2030, with a much higher proportion of elderly patients.

One challenge will be to convince more young physicians to choose medical oncology as a specialty and to ensure that training is adapted to consider an aging population with multiple co-morbidities. This might not be enough, and alternative solutions may be required to strike a balance between supply and demand, e.g. through improved sharing of the non-medical tasks with non-physician practitioners such as specialised nurses, psychologists, social workers, or administrative employees to handle excessive paperwork. Better collaboration with general practitioners is essential as well. Beyond these ideas, other imaginative solutions will be needed. The recent recognition of medical oncology at a European level is a step in the right direction to sustain this new specialty.

Our analysis of the current and future supply and demand of medical oncologists in Belgium is only the first step of an initial, thorough assessment of the situation needed to identify the challenges of medical oncology as a new specialty and to address the multifaceted issues associated with treating cancer in the future.

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