

INTERNATIONAL MONETARY FUND

The Fiscal Cost of Aging in Belgium – Pensions and Healthcare

Jean-Jacques Hallaert

SIP/2023/065

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on November 20, 2023. This paper is also published separately as IMF Country Report No 23/387.

2023
DEC



SELECTED ISSUES PAPER

IMF Selected Issues Paper
European Department

The Fiscal Cost of Aging in Belgium – Pensions and Healthcare
Prepared by Jean-Jacques Hallaert

Authorized for distribution by Jean-François Dauphin
December 2023

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on November 20, 2023. This paper is also published separately as IMF Country Report No 23/387.

ABSTRACT: *Belgium faces a fiscal consolidation challenge at a time when the fiscal cost of aging—primarily related to pension and health outlays—is mounting. Pension spending will increase relatively fast unless a combination of measures related to pension generosity and retirement eligibility are put in place. Potential efficiency gains are large in the health sector and could absorb part of the fiscal and reorganization costs related to an aging population.*

RECOMMENDED CITATION: *Hallaert, Jean-Jacques (2023). The Fiscal Cost of Aging in Belgium – Pensions and Healthcare, Washington DC: International Monetary Fund, Selected Issues Paper, SIP/2023/065*

JEL Classification Numbers:	H51, H53, H55, H68, H75, I11, I13, I19, J24
Keywords:	Belgium, Aging, Fiscal cost of aging, Pensions, Healthcare
Author's E-Mail Address:	jhallaert@imf.org

SELECTED ISSUES PAPERS

The Fiscal Cost of Aging in Belgium – Pensions and Healthcare

Belgium

Prepared by Jean-Jacques Hallaert



BELGIUM

SELECTED ISSUES

November 20, 2023

Approved By
European Department

Prepared Jean-Jacques Hallaert (EUR)

CONTENTS

THE FISCAL COST OF AGING – PENSIONS AND HEALTHCARE	<u>3</u>
A. A Rapidly Aging Country	<u>4</u>
B. The Fiscal Cost of Aging	<u>7</u>
C. Containing the Cost of Pensions	<u>9</u>
D. Increasing Spending Efficiency to Mitigate the Impact of Aging on Healthcare Costs	<u>17</u>
E. Conclusion	<u>26</u>
BOXES	
1. Various Population Projections	<u>6</u>
FIGURES	
1. An Aging Population	<u>5</u>
2. Old Age Dependency	<u>6</u>
3. Aging Intensity	<u>6</u>
4. Healthcare Needs Increase Rapidly with Age	<u>7</u>
5. Financing of Social Expenditure in the EU Members of OECD	<u>7</u>
6. Aging Cost Pressure and Debt Level	<u>8</u>
7. Cost of Aging Under Alternative Scenarios	<u>8</u>
8. Breakdown of the Cost of Aging	<u>9</u>
9. Spending on Pensions by Functions - 2008-2020	<u>10</u>
10. Pension Beneficiaries (In percent of population)	<u>10</u>
11. Contribution to Increase in Pension Beneficiaries	<u>11</u>
12. Real Annual Growth in Social Spending on Pension and Health	<u>11</u>
13. Pension Support and Pension Spending	<u>12</u>
14. Spending on Pensions by Functions - 2020-70	<u>12</u>
15. Gross Replacement Rate of Public Pensions	<u>14</u>

16. Contribution of the Benefit Ratio Effect to the Change in Public Pension Expenditure	15
17. Illustrative Scenarios of the Impact of Measures to Contain on Pension Spending	16
18. Health Outcomes	17
19. Self-Reported Unmet Needs Due to Healthcare Organization	17
20. Benchmarking Health Spending	18
21. Public Health Spending in the EU	18
22. Health Spending	18
23. Health Efficiency Frontier	19
24. Healthcare Expenditure and Death from Preventable Disease	19
25. Incidence of and Death from Cancers	20
26. Use of Medical Imagery	21
27. Share of Generics in the Total Pharmaceutical Market	22
28. Length of Hospital Stay	23
29. Density of Hospital Beds	24
30. Share of Elderly Population Reporting At Least One ADL or IADL	25
31. Long-Term Care Spending	26

TABLES

1. Population Growth by Age Group	4
2. Contribution to the Projected Increase in Pension Spending	13
3. NBB Estimates of the Impact of Policy Scenarios on Pension Spending	14
4. Maintaining Pension Spending at Their 2020 Level – Illustrative Scenarios	15
5. Saving from Efficiency Gains	20
6. Spending on Hospitals	23
References	28

THE FISCAL COST OF AGING – PENSIONS AND HEALTHCARE ¹

Belgium faces a fiscal consolidation challenge at a time when the fiscal cost of aging—primarily related to pension and health outlays—is mounting. Pension spending will increase relatively fast unless a combination of measures related to pension generosity and retirement eligibility are put in place. Potential efficiency gains are large in the health sector and could absorb part of the fiscal and reorganization costs related to an aging population.

1. Belgium faces a fiscal consolidation challenge, while the fiscal cost of aging is mounting.² This Selected Issues Paper documents the magnitude of the fiscal cost of aging in the coming decades focusing on pensions and healthcare. It discusses policies that would allow to contain the increase in the cost of aging, while preserving the adequacy of pension and the outcome of health spending.

2. Though this paper focuses on the direct fiscal cost of aging, fiscal costs may also be indirectly affected by the macroeconomic impact of aging. Though the net macroeconomic impact of aging is uncertain, the cost of aging (as a share of GDP) could increase further if growth is reduced due to reduced labor.³ Potential growth could be affected if aging results in reduced labor contribution and productivity growth. Because consumption changes over the life cycle, the structure of aggregate consumption is also likely to evolve. In the case of Belgium, Lefèbvre (2006) points to “increases in health, housing and leisure expenditures and decreases in equipment, clothing, and transport expenditures. These changes [...] will translate in sectoral shifts and most probably in changes in sectoral employment.”⁴ The OECD (2023) estimates that, based on the 2021 Ageing Report baseline scenario (EC, 2021), the share of long-term care workers in total employment would increase by 1/3 of a percentage point (ppt) between 2023 and 2033 and by another 1/2 ppt between 2033 and 2043. This would affect economy-wide productivity growth as “labor productivity growth in the LTC sector is projected to be lower than in the overall economy.” Moreover, growth may be affected if the rising fiscal cost of aging crowds out other and more

¹ Prepared by Jean-Jacques Hallaert (EUR). The author thanks Jean-François Dauphin, Mark Horton, and Yu Ching Wong for useful comments and staff and officials of the Belgium’s Prime Minister Office, the Federal Planning Bureau, the Ministry of Health, the Belgian Health Care Knowledge Centre (KCE), Sciensano, the National Bank of Belgium, the SPF Santé Publique - FOD Volksgezondheid, the SPF Sécurité Sociale - FOD Sociale Zekerheid, INAMI-RIZIV, participants at a National Bank of Belgium Seminar, Johan Van Gompel (former President of the Study Committee on Aging), Anja Declercq, and Erik Shokkaert (both KU Leuven) for helpful discussions. Xun Li provided invaluable research assistance.

² See Selected Issues Paper “Fiscal Consolidation in Belgium: How Much and By What Means” by Yu Ching Wong.

³ For example, improvements in functional capacity in terms of mortality, disability, strength, and cognition wrought by healthy ageing could significantly affect the cost of aging notably its growth impact (Kotschy and Bloom, 2023).

⁴ The change in consumption structure may also affect tax revenue and its composition. Pensions and healthcare spending are likely to be increasingly financed by general revenue rather than payroll contribution due to the old age dependency increase.

productive public spending (Lindert, 2021). In a recent analysis, Kotschy and Bloom (2023) estimate that annual growth rate of Belgium could be reduced by 2050 by 1/10 to 2/3 ppt.

3. This paper is organized as follows. The first section documents the expected aging of the population of Belgium. The second section quantifies the expected cost of aging and its underlying drivers. The third section focuses on pensions, showing that the faster increase in pension costs than in peer countries is likely to continue if no measures are taken. It discusses various policy options to contain the rising cost of pensions. The last section turns to healthcare costs, arguing that health outcomes are comparatively good in Belgium but achieved at a higher cost than in peers. The section presents policies and reforms that could increase spending efficiency. Efficiency gains would help absorb part of the fiscal cost of aging related to healthcare. The section also emphasizes the need to reorganize the healthcare system to prepare for the needs of an aging population.

A. A Rapidly Aging Country

4. The population of Belgium is aging rapidly and expected to continue doing so. Over 2005-22, the number of Belgians 65 years and older increased almost three times faster than the population below 65 (+ 1.4 percent per year vs. + 0.5 percent per year). Moreover, aging has been accelerating: while the population 65 and older grew less than the population 65 and younger during 2005-11, it grew nine times faster during 2016-22. As a result, almost one Belgian out of five is now 65 or older. The baby boom generation reaching retirement age partly explains the acceleration of the aging of the population. Although this impact will fade, the aging process is expected to continue (Table 1 and Figure 1).

Table 1. Belgium: Population Growth by Age Group
(Annual Average in Percent)

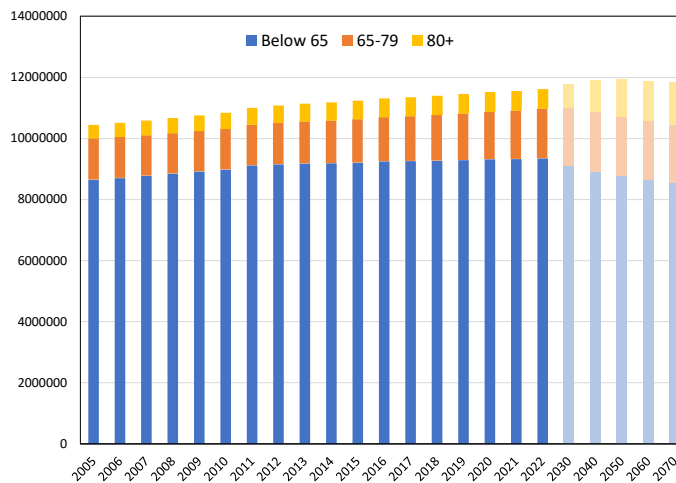
	2005-2011	2016-2022	2005-2022
Total	0.9	0.4	0.6
<65	0.9	0.2	0.5
65+	0.8	1.6	1.4

Sources: Eurostat and IMF staff calculations.

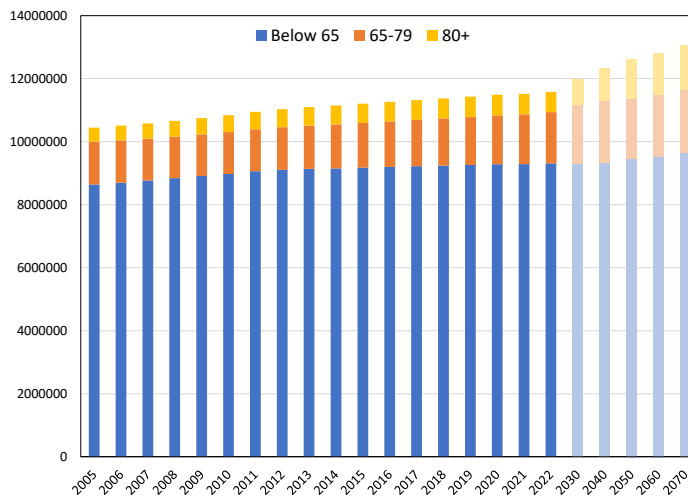
5. However, the exact pace of aging is uncertain. Due to differences in assumptions, databases, starting points, and models, demographic projections differ significantly in the speed of aging although all concur that it will be rapid (Box 1 and Figure 1). According to Europop 2019, the population will start declining in 2048, due to a decline in the population below 65 years. The share of the population 65 and older is expected to increase by over 8 ppts to 28 percent in 2070, driven by a sharp increase in the population 80 and older (+ 6 ppts). A more recent exercise (Europop 2023) projects an increase in the total population throughout the projection period. The decline in the population below 65 is much smaller than previously projected, while the increase in the share of population 65 and over remains broadly unchanged. A third projection, recently conducted by Belgium's Federal Planning Bureau and Statbel projects a much faster increase in total population (+ 9.2 percent between 2022 and 2070 vs + 3.6 percent for Europop 2023). In contrast with Europop, the population younger than 65 would increase. The share of population 65 and over would increase less than projected in Europop 2023 (6½ ppts versus 8½ ppts).

Figure 1. Belgium: An Aging Population (2008-70)

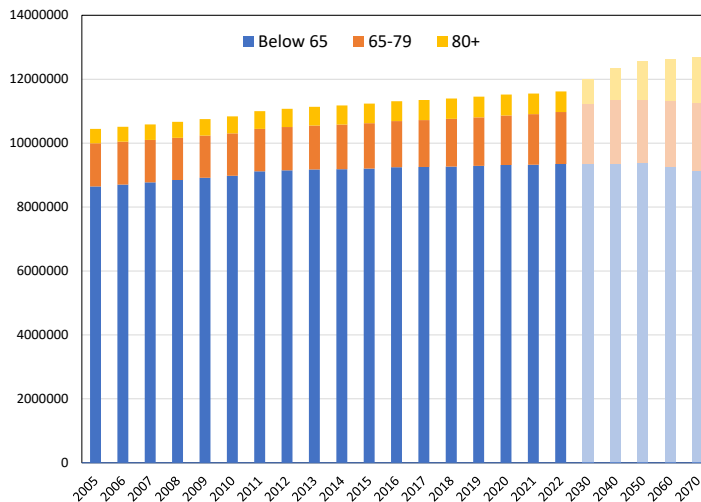
EUROPOP 2019



Federal Planning Bureau / STATBEL (2023)



EUROPOP 2023



Sources: Eurostat, Federal Planning Bureau and Statbel, and IMF staff calculations.

Box 1. Belgium: Various Population Projections

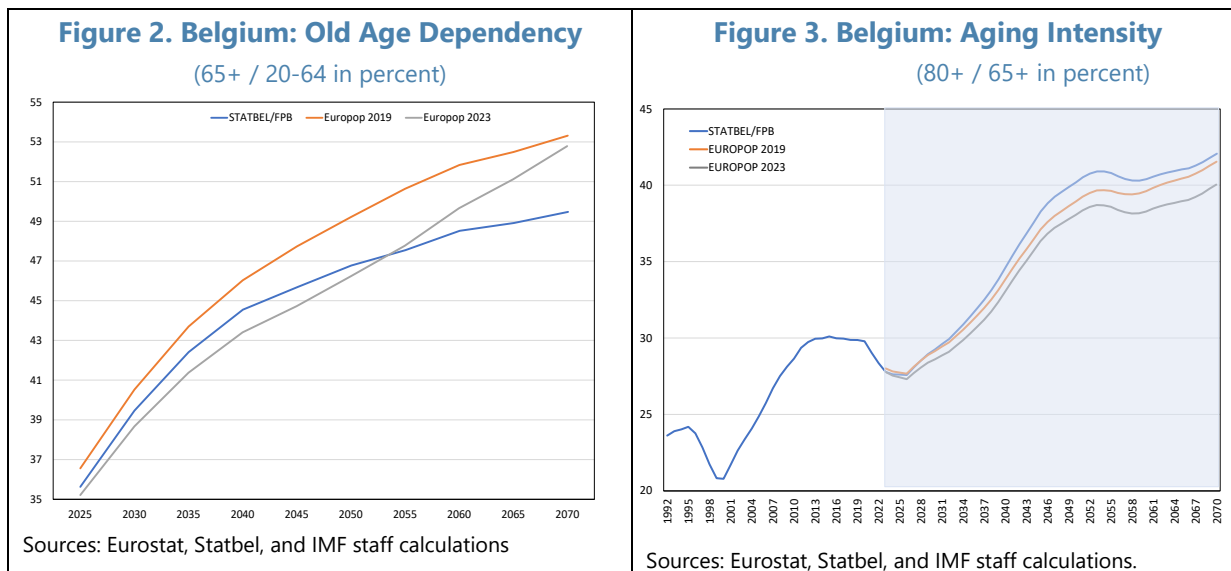
EUROPOP 2019. Population projections (size and structure) done in 2019 for the period 2019-2100 for all EU Members, Iceland, Liechtenstein, Norway, and Switzerland. These projections underpin the 2021 Ageing Report, which covers the period 2019-70 (EC, 2021). Data, metadata, and methodology are available on the [Eurostat website](#).

EUROPOP 2023. Population projections (size and structure) done in 2023 for the period 2022-2100 for all EU Members, Iceland, Norway, and Switzerland. These projections will underpin the forthcoming Ageing Report. Data and methodology are available on the [Eurostat website](#).

Federal Planning Bureau / STATBEL. The Federal Planning Bureau, in collaboration with Statbel (the Belgian statistical office), publishes annually population projections for Belgium. In this paper, the latest publication (2023) is used. Projections are available for the period 2023-2071 (Statbel, 2023). These projections inform the annual report of the Study Committee on Aging (Bureau fédéral du Plan / Conseil Supérieur des Finances, 2023). Data and methodology are available on the [Statbel website](#).

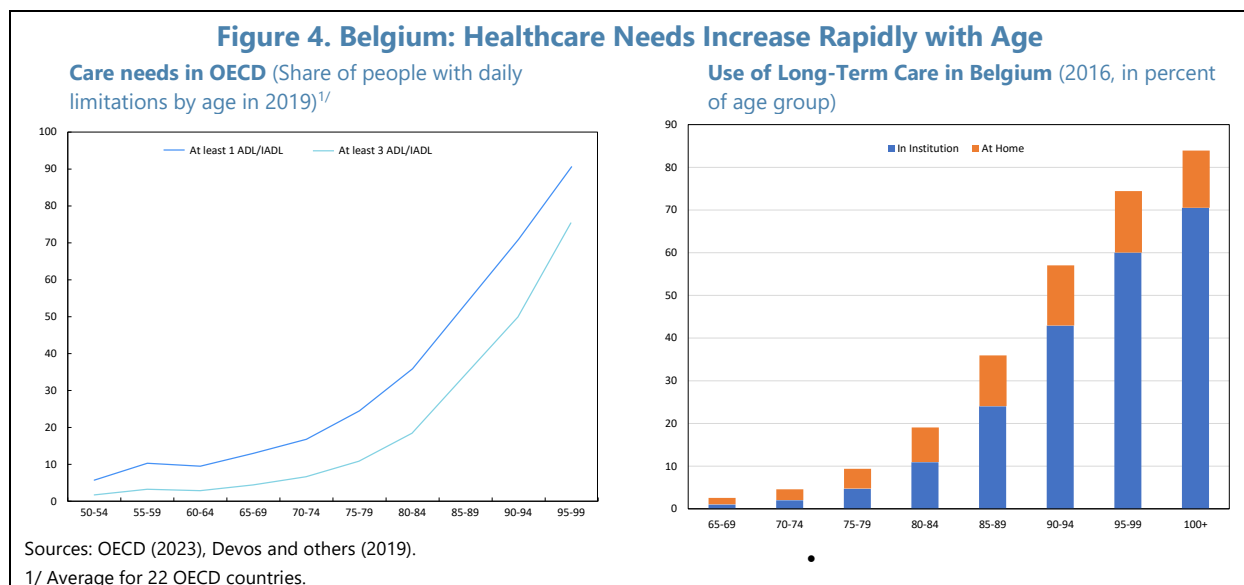
6. Despite uncertainty in the pace of aging, the various projections concur on important drivers of the fiscal cost of aging:

- *Old age dependency will increase markedly.* EuroPOP projections and national projections result in an increase in old age dependency that is both sharp and broadly similar for the next 3 decades (Figure 2). This will have a strong impact on pension costs.



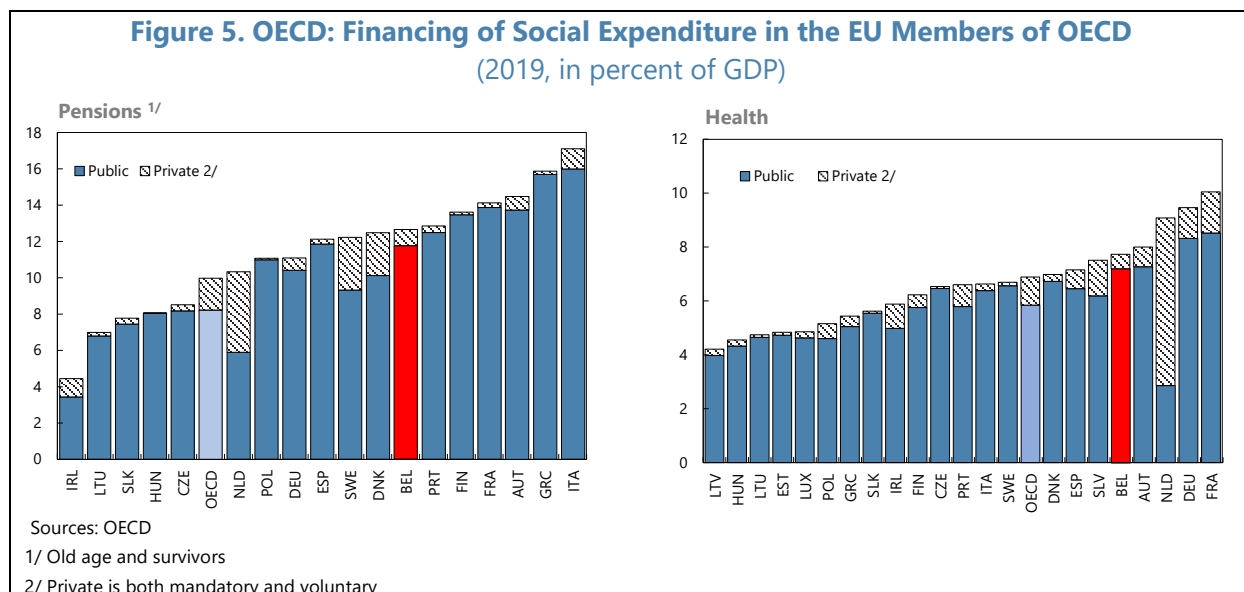
- *The elderly population is aging.* The share of population that is 80 years and older, which already increased from 3½ percent in 2000 to 5½ percent in 2022, is projected to double by 2070. The population 80 and older accounted for 21 percent of the population 65 and older in 2020, 28 percent in 2022, and is projected to account for 40-42 percent of the elderly population in 2070 (Figure 3). The increase in aging intensity will have strong impact on healthcare cost. Indeed, health needs grow more than proportionally with age (Figure 4). Kotschy and Bloom (2022) estimate that

the number of Belgian older than 65 with at least two limitations in activities of daily living (ADL) or instrumental activities of daily living (IADL) will increase from 3 percent of population to 4½ percent of population between 2020 and 2040.⁵



B. The Fiscal Cost of Aging

7. As health and pension spending is mostly financed publicly, the cost of aging is a fiscal challenge (Figure 5). This challenge is significant:

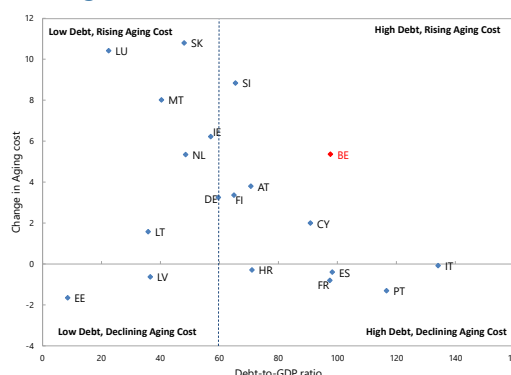


⁵ Care needs can be measured by the need to be (1) assisted with personal care (through help for activities of daily living, or ADL, such as eating, washing and dressing) and (2) assisted to live independently (through help for instrumental activities of daily living, or IADL, such as cooking, shopping, and managing finances).

- *Belgium is among the few EU Members facing both a high debt level and a significant projected increase in the cost of aging* (Figure 6).⁶ In the 2022 fiscal sustainability report, the European Commission estimates that half the fiscal adjustment needed in 2023 to stabilize in the long run the debt-to-GDP ratio is related to the expected increase in aging cost (EC, 2022).

- *Aging could increase fiscal spending by 5.4 percent of GDP annually between 2019 and 2070.* Under the reference scenario of the 2021 Ageing Report and the 2023 report of Belgian Study Committee on Aging, about half of the increase would be due to pensions and the other half to healthcare (including long-term care). However, uncertainty is large: the Ageing Report’s alternative scenarios suggest that the projected increase in the fiscal cost of healthcare cost vary by +/- 2 ppts (Figure 7).

Figure 6. Aging Cost Pressure and Debt Level
(Changes in aging cost, 2019-70, as percentage of GDP;
government debt-to-GDP in 2019)

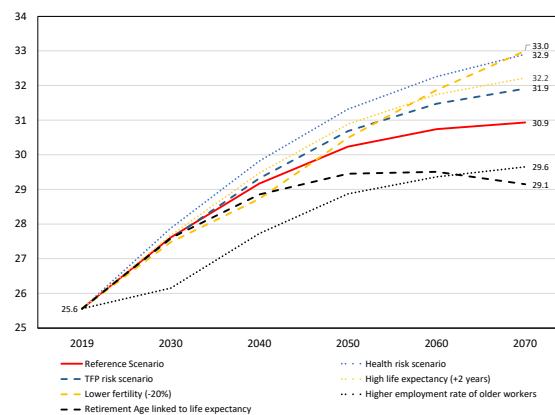


Sources: Haver Analytics, EC (2021), Study Committee on Aging (2023), and IMF staff calculations.

- *A large share of the fiscal cost of aging will take place in the current decade.* Between 2/3 (Study Committee on Aging) and 2/5 (2021 Ageing Report) of the fiscal cost of aging for 2019-70 is expected to take place by 2030 (Figure 8). Therefore, the cost of aging will conflict with the need for sustained fiscal consolidation in the coming years. The uncertainty in the estimated increase in spending by 2030 is not due to pensions but to healthcare. The Study Committee of Aging projects that healthcare cost would increase faster than both the Ageing Report’s baseline scenario and adverse health risk scenario.⁷ According to the Study Committee of Aging, 1.2 ppt of the projected

increase in the cost of aging between 2019-70 had already materialized by end 2022. Another important difference between the two projections is that the healthcare cost of aging is driven by long-term care according to the

Figure 7. Belgium: Cost of Aging Under Alternative Scenarios

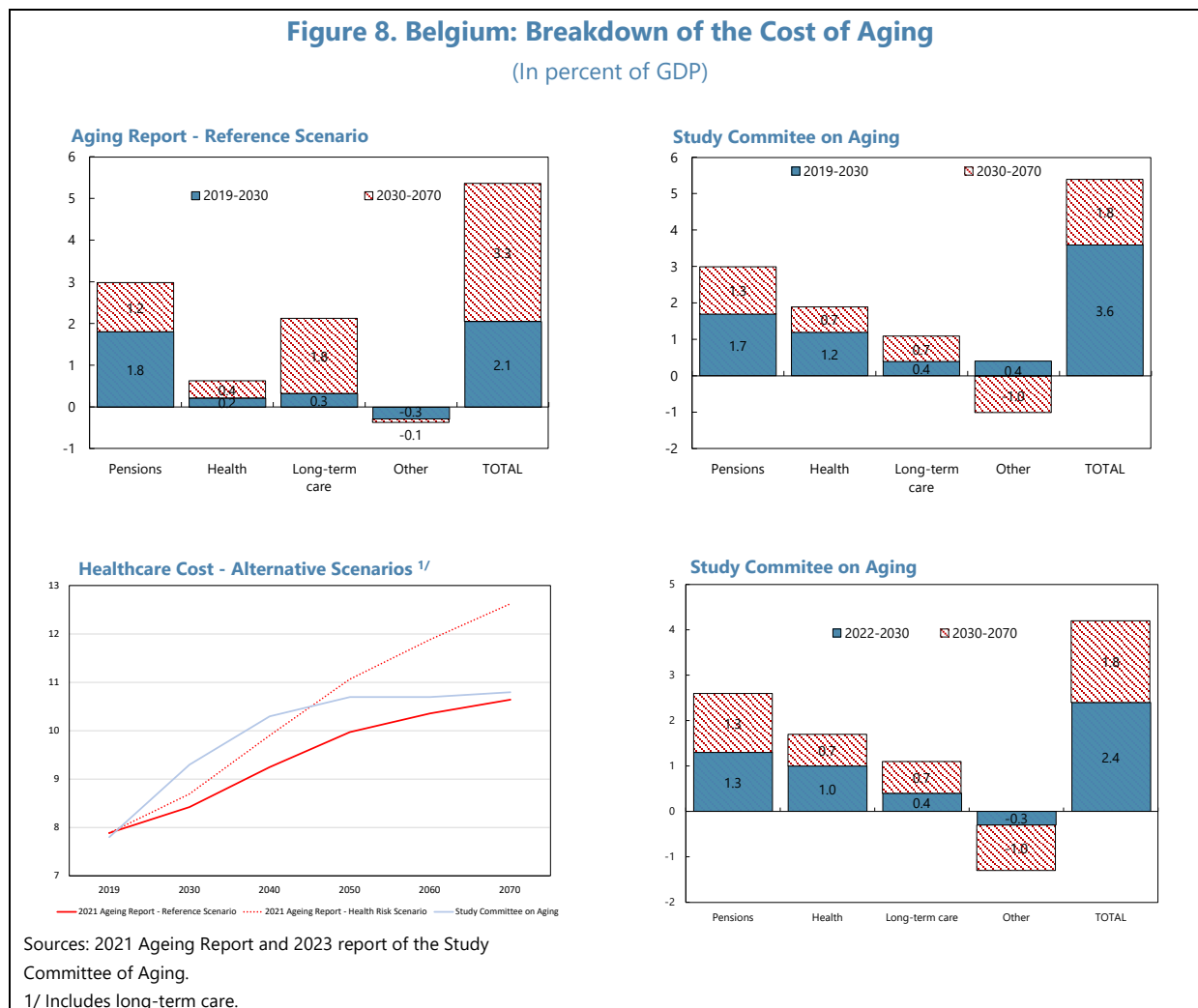


Source: 2021 Ageing Report (EC, 2021).

⁶ The cost of aging as described below is due to the interaction of aging dynamics and design and features of social protection spending

⁷ The health risk scenario captures the impact of non-demographic factors on health and long-term care expenditure. Notably, this scenario assumes a partial continuation of upward healthcare expenditure trends (in part due to technological progress) and a stronger increase in the cost and coverage of long-term care.

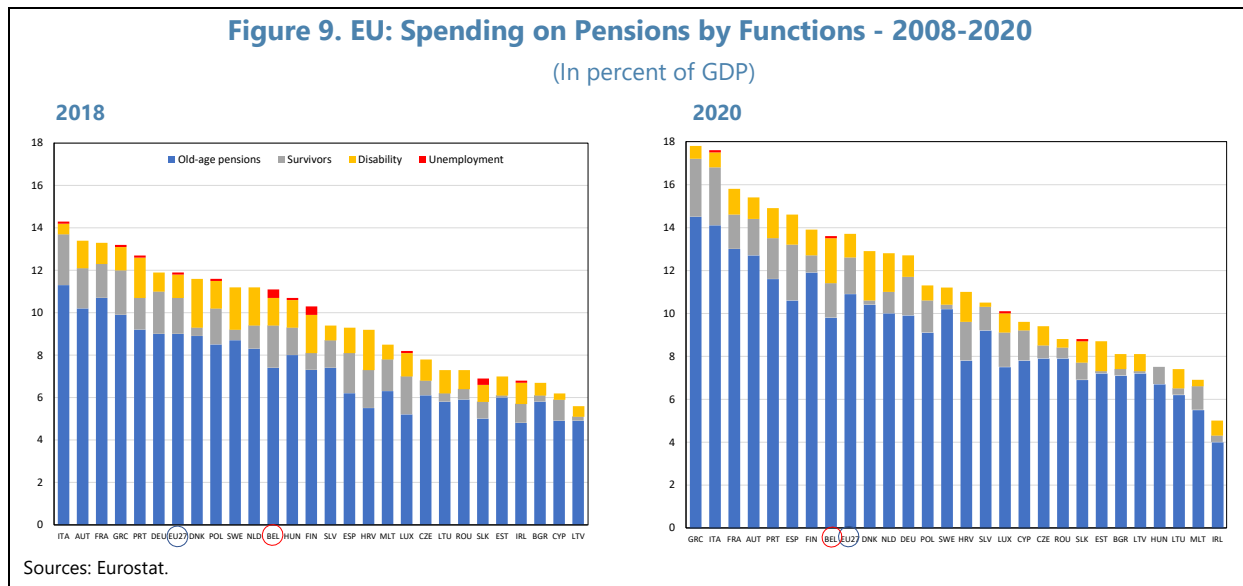
2021 Ageing Report while it is driven by acute care according to the Study Committee of Aging. This difference has large implications: (i) the reforms and policies needed to prepare the healthcare system for long-term versus acute care needs are different, and (ii) the fiscal burden falls on different federal entities, as regions are in charge of long-term care while acute care is financed by the federal government.



C. Containing the Cost of Pensions

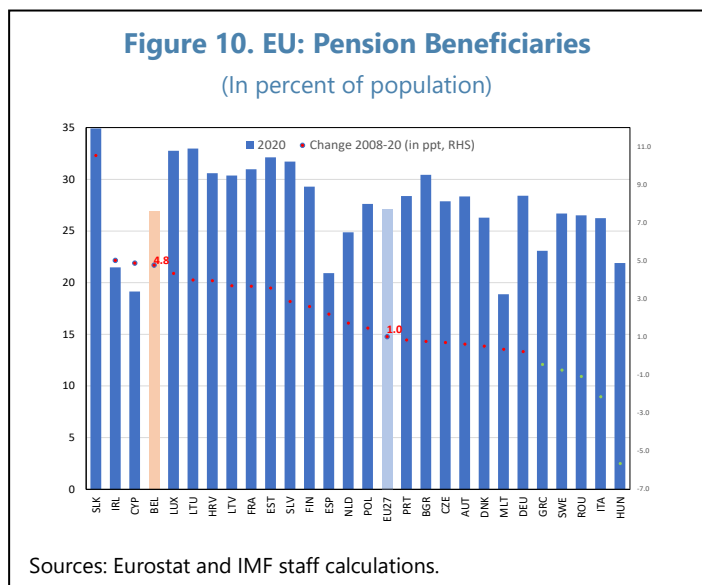
A Rapid Increase in Spending on Pensions

8. The cost of pensions has increased rapidly. From 2008 to 2020, the pension-to-GDP ratio increased by 23 percent. As this increase was more rapid than for EU peers, the spending on pensions rose from below EU level to the EU average of 13.6 percent of GDP (Figure 9).



9. The stronger increase in spending on pensions results from a rapid increase in pension beneficiaries. The number of pension beneficiaries increased by 31 percent in Belgium between 2008 and 2020 while it increased by 4 percent in the EU as a whole. In other terms, in slightly over a decade, the share of pension beneficiaries in total population increased by almost 5 pts while it increased by 1 ppt in the EU (Figure 10).

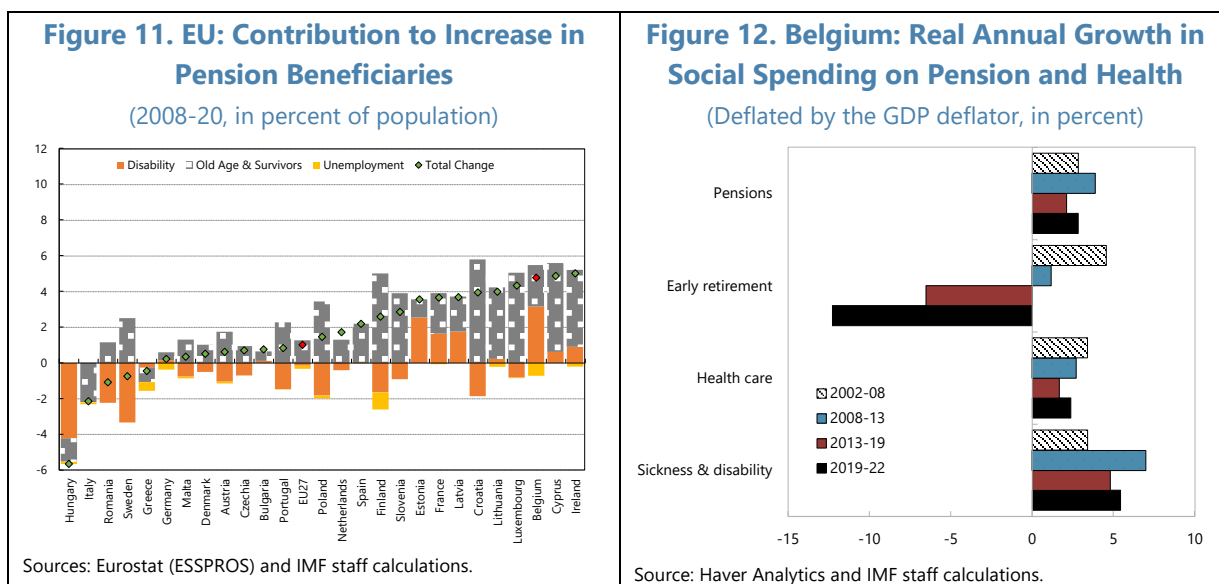
10. The increase in pension beneficiaries is primarily driven by the increase in pension disabilities. By design, aging leads to an increase in people receiving a pension for “old age and survivor.” This type of pension is the primary driver of the increase in pension beneficiaries in the EU. In contrast, in Belgium, beneficiaries of old age and survivor pensions account for less than half the total increase in pensioners. The main driver is the increase in beneficiaries of disability pensions as defined by ESSPROS (Eurostat, 2019).⁸ This increase



⁸ ESSPROS defines disability pension as a “periodic payments intended to maintain or support the income of someone below the reference retirement age as established in the reference scheme who suffers from a disability which impairs his or her ability to work or earn beyond a minimum level laid down by legislation.” “Disability pensions, in contrast to early retirement benefits due to reduced capacity to work, are not necessarily linked to a full retirement of the disabled person. The expression ‘beyond a minimum level laid down by legislation, [...]’ implies significant differences among disability arrangements in the Member States.” “For reasons of comparability, and in

(continued)

is partly offset by a decline in pensions for labor market conditions (Figure 11). The policy measures taken in the 2010s (IMF, 2019; Deroose and others, 2023) to tighten eligibility to early retirement led to a sharp decline in early retirement spending (Figure 12). This tightening, as well as the increase in the labor force participation of older workers, contributed to the increase in real spending on sickness and disability (IMF, 2020; OECD IMF, 2020; OECD, 2022a).

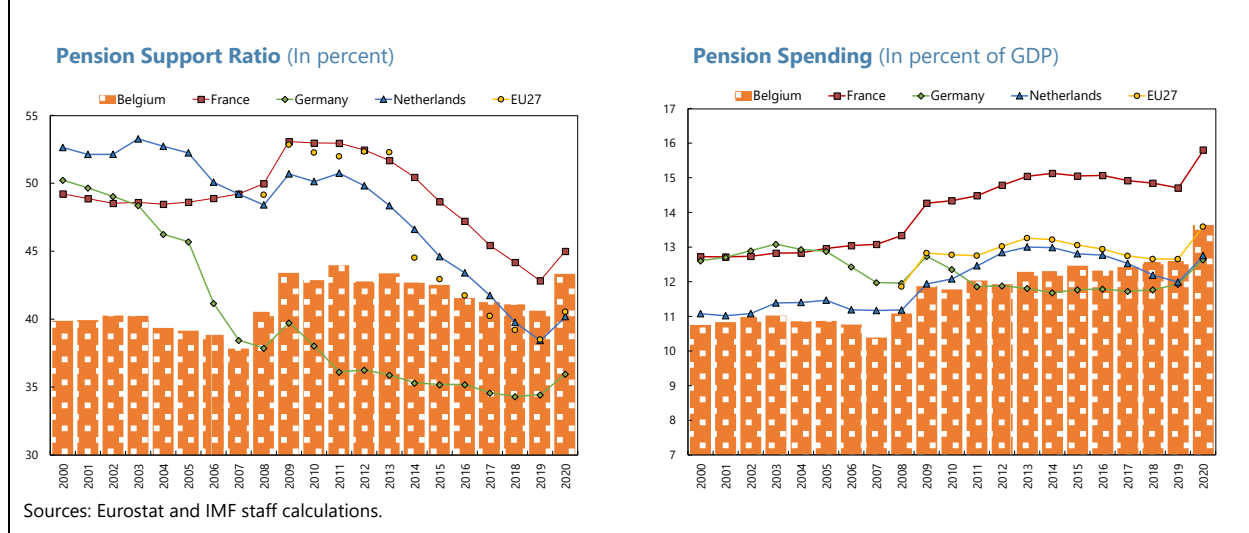


11. Another reason for the rapid increase in pension spending is that Belgium has not reduced the generosity of its pension system, in contrast to EU peers. Following Lindert (2021), generosity of the pension system is measured by the support ratio defined as pension benefit per person over 65 divided by GDP per person of working age (18-64). Due to aging, the decline in the support ratio needs to be large to result in a decline in pension-to-GDP spending. In the recent past, through pension reforms, all peers reduced their support ratio, more than offsetting the increase during the Global Financial crisis (GFC). Despite a rebound during the pandemic,⁹ their support ratios remain below their GFC peak. This allowed to contain pension spending and, in some cases, to reduce it. In contrast, Belgium has not implemented sufficient measures to reduce the generosity of pensions and, as a result, the support ratio, which was below all peers up to 2008, is now the highest among peers (except France) and the pension-to-GDP ratio has since grown steadily (Figure 13).

order to respect the principle of the functional classification of the ESSPROS, disability pensions paid to beneficiaries over the reference retirement age as established in the reference scheme must be recorded under the item old age pension. The reason for receiving a disability pension after the reference retirement age is connected to old age rather than to the impairment of his or her ability to work.” (Eurostat, 2019).

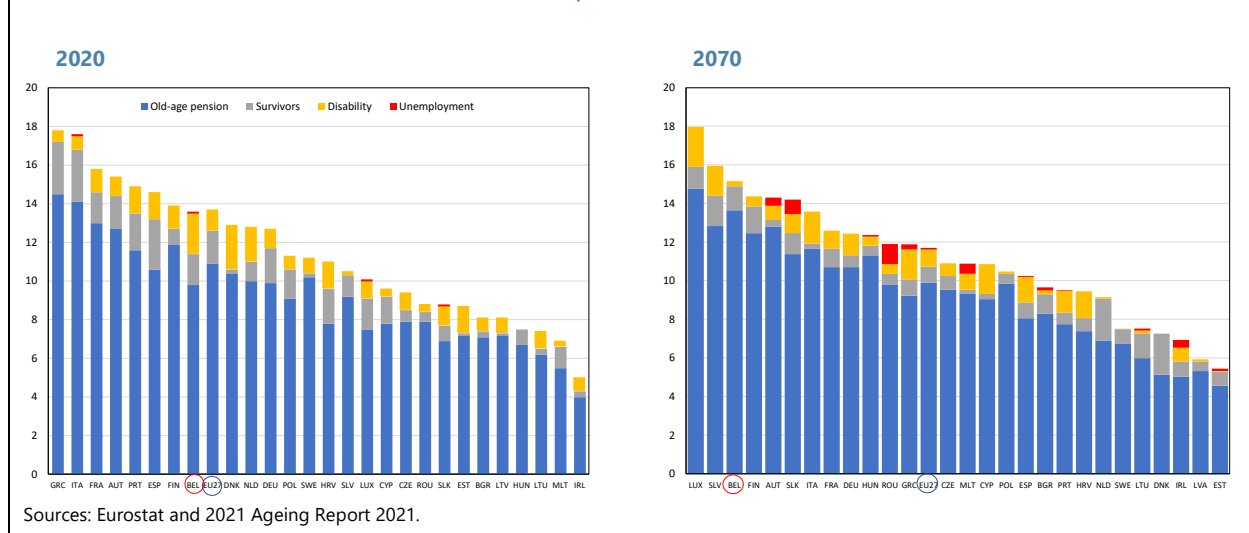
⁹ The rebound is due to a denominator effect and in some countries increased pensions to support demand.

Figure 13. EU: Pension Support and Pension Spending



12. Looking ahead, the 2021 Ageing Report projects that pensions spending will continue to rise. Belgium’s spending on pension is projected to continue increasing faster than for peers (Figure 14 and Table 2). For example, it is projected to increase by about 3 percent of GDP between 2019 and 2070 (Figure 8), while it would remain broadly stable for the EU (+0.1 percent of GDP). As a result, the pension-to-GDP ratio would increase from EU level in 2020 to the third highest in the EU in 2070.

Figure 14. EU: Spending on Pensions by Functions - 2020-70
(In percent of GDP)



13. Aging is a key determinant of the projected growth in pension spending. The sharp increase in the dependency ratio (Figure 2) would increase pension spending by about 7 percent of GDP (Table 2). This is comparatively large. However, the case of France highlights that policy measures have a role to play. France faces a similar increase in the dependency ratio as Belgium, but

its pension-to-GDP ratio is projected to decline thanks to stronger containment from the coverage and benefit ratios (Table 2).¹⁰

	Dependency ratio	Coverage ratio	Benefit ratio	Labor Market effect	Interaction Effect	Total
Belgium	7.2	-1.8	-1.8	-0.3	-0.2	3.0
EU	6.4	-1.5	-3.7	-0.8	-0.3	0.1
France	7.1	-2.0	-5.9	-1.0	-0.4	-2.2
Germany	4.9	-0.9	-1.4	-0.2	-0.3	2.1
Netherlands	4.3	-1.2	-0.3	-0.4	-0.1	2.3

Source: 2021 Ageing Report.

Policy Options

14. Containing the rise of pension spending is necessary to ensure the sustainability of the pension system, avoid crowding out productive investment, and support fiscal consolidation.

The drivers of the projected increase in pension spending identify by the 2021 Ageing Report (Table 2) highlight policy levers that can be used:

a) Increase labor force participation. The Ageing Report projects that the change in employment rate will account for only 1/3 of the small labor market effect reported in Table 2. Measures to increase the labor force participation of older workers and to work longer could have an important impact on spending by reducing the coverage ratio.¹¹ According to the National Bank of Belgium (NBB), if the authorities meet their objective to increase the relatively low employment rate to 80 percent, pension cost will decrease rapidly and strongly (Table 3).

b) Tighten the eligibility to pension. Measures to tighten the eligibility to pensions (for example eligibility to disability pensions) or further increasing the retirement age can increase the relatively high contribution of the coverage ratio to the containment role of pensions (Table 2).¹²

¹⁰ France implemented several pension reforms since 1993. Notably, reforms implemented in 1993, 2003, 2010, and 2014 rose both the pensionable age and the contribution period necessary to reach full pension and eliminated most early retirement schemes (Duc, 2015; Hallaert and Queyranne, 2016). The impact of the pension reform adopted in 2023 is not incorporated in Figure 13.

¹¹ The coverage ratio is the number of pensioners to the number of people 65 and older.

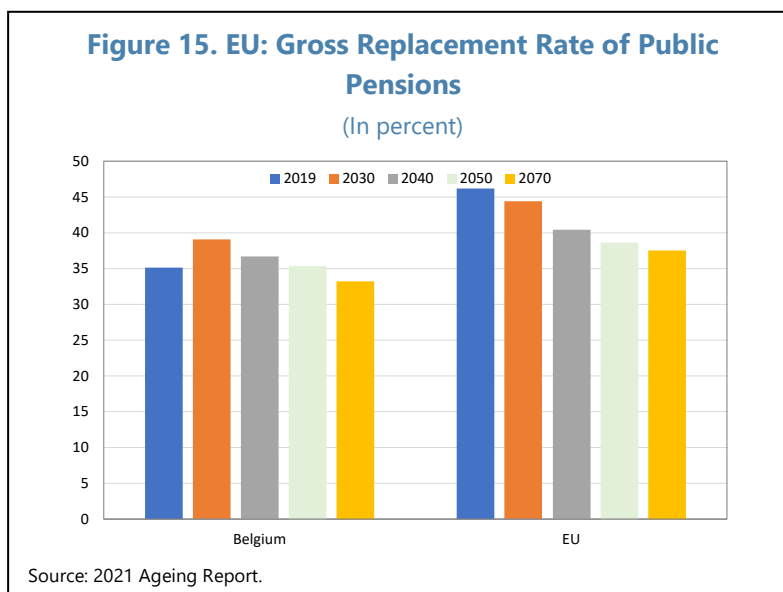
¹² The decision to replace the disability pension for civil servants with a system of allowances has been taken by the government. This will end the current system under which civil servants who are fully incapacitated receive a disability pension, calculated as an old-age pension. At time of writing the modalities of the measure were not yet decided and an adoption by Parliament was expected by end-2023.

The NBB estimates that reducing the coverage ratio in Belgium toward the euro area average would reduce the pension cost by 1.1 percent of GDP in 2030 (Table 3).

	by 2030	by 2050	by 2070
Coverage ratio towards euro area average	-1.1	-0.6	-0.5
Average pension towards euro area average	-0.3	-2.0	-2.1
Employment rate increases to 80 percent	-1.4	-1.6	-1.7
Higher productivity by 0.2 percentage point	-0.1	-0.7	-1.2

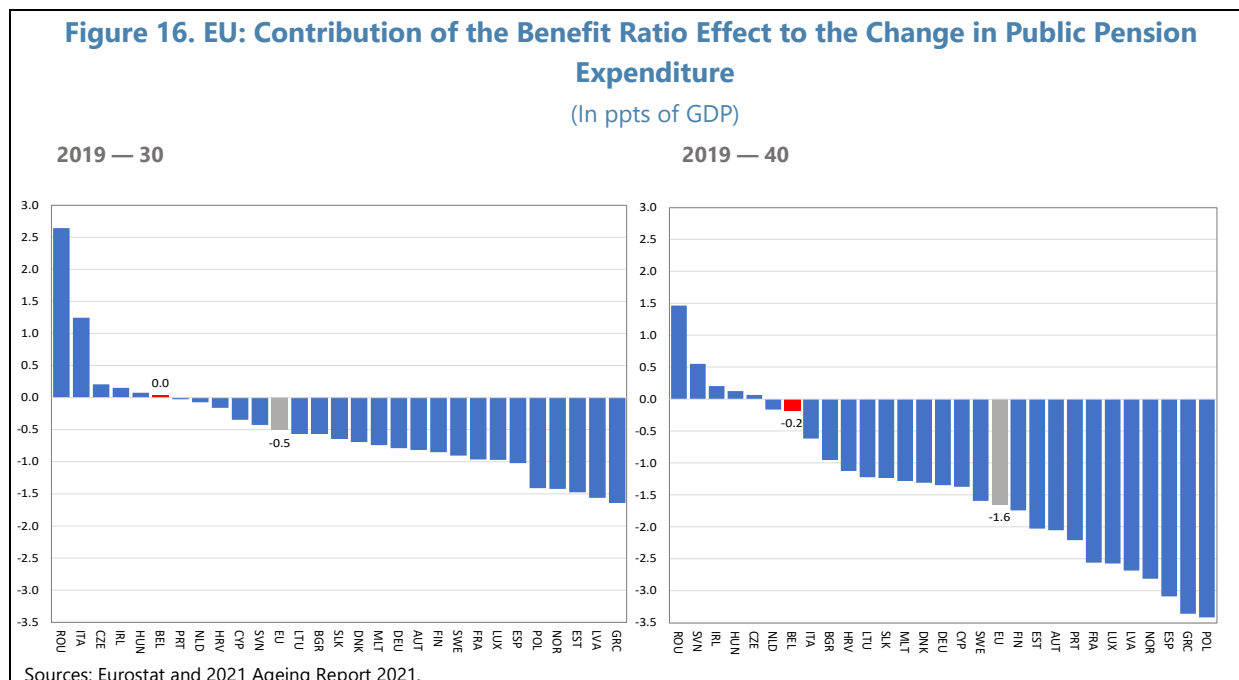
1/ The baseline scenario is the 2021 Ageing Report projections (EC, 2021).
Source: Deroose and others (2023).

c) Avoid an increase in the generosity of pensions. The gross replacement rate is projected to increase in the current decade and to remain above its 2019 level until the early 2050s (Figure 15).¹³ Avoiding such an increase would help rapidly contain pension spending especially if combined with other measures to accelerate the reduction in the benefit ratio that is projected to be backloaded (Figure 16). The decline of the benefit ratio will be smaller than projected by the Ageing report due to recent measures such as the increase in the minimum pension and the increase in the upper wage limit used to calculate pension entitlement (Deroose and others, 2023).¹⁴



¹³ The gross replacement rate is the average first pension as a share of the economy-wide average wage at retirement.

¹⁴ The benefit ratio is the average pension as a share of average compensation.



15. What would it take to stabilize the pension-to-GDP ratio by 2030 or by 2050?

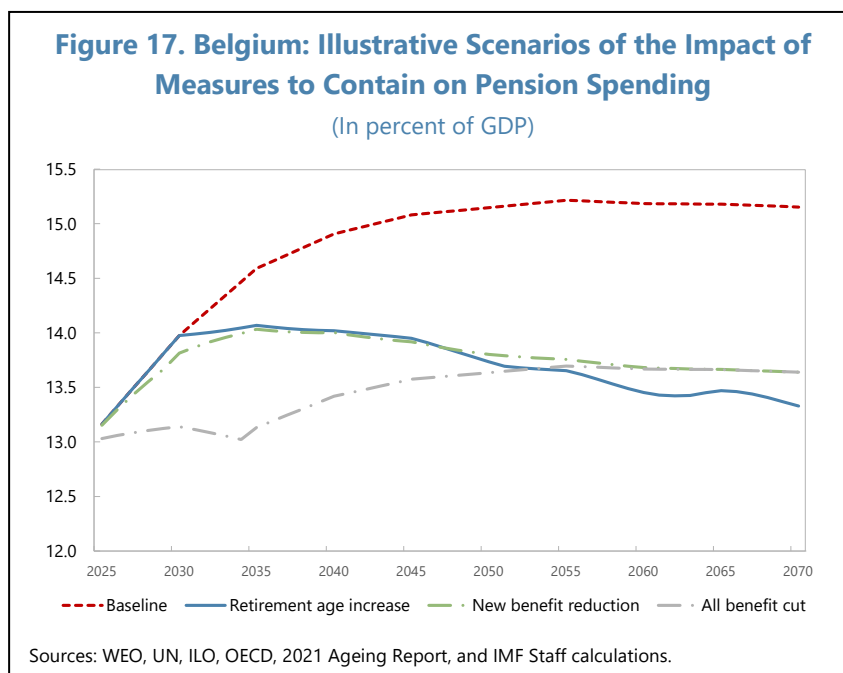
Preventing an increase in pension spending in the short-term would help implement the needed fiscal consolidation. Table 4 presents the results of macro-simulations of measures that would stabilize the pension-to-GDP ratio at its (high) 2020 level. These results present alternative trade-offs between various policy measures and suggest that a combination of measures may be the simpler way to contain pension costs. The results should be seen as illustrative because the model, though calibrated for Belgium, is highly simplified and does not reflect all the benefit rules and parameters of the Belgian pension system.

Table 4. Belgium: Maintaining Pension Spending at Their 2020 Level – Illustrative Scenarios

	by 2030	by 2050	
Increase retirement age ^{1/}	<1 year	2 years	} (1)
Reduce benefit	~7.0%	~11.5%	
Increase retirement age & reduce benefit	...	1 year & 6½ percent	
Increase in social contributions	~1.0%	~4½%	(2)
Increase retirement age & social contributions	...	1 year & 2½%	} (3)
Reduce benefits & increase social contributions	1.0% & 0.8%	4.0% & 3.0%	

Sources: Eurostat, 2021 Ageing Report, and IMF staff calculations.
1/ Starting in 2025 for both male and female.

16. Another set of staff macro-simulations illustrate how further increasing the retirement age and/or cutting benefits would contain spending over time. The first scenario simulates the impact of linking retirement age to life expectancy gains starting in 2030, i.e., when the current measure to increase progressively the retirement age for men and women from 65 to 67 is completed.¹⁵ This would allow to reverse the increase in pension spending starting in 2035. The pension-to-GDP ratio would come back close to its 2025 level by 2070 and be about 2 points lower than in the baseline. This would require setting the retirement age in 2070 at 70.5 years. The second scenario simulates the impact of 10 percent reduction in benefits between 2025 and 2034 (1 percent each year) for all pensioners (no grandfathering) or only for new pensioners (grandfathering). The saving in the short-term is larger than under the retirement age scenario but, in the long-term, results in a lower saving (Figure 17).



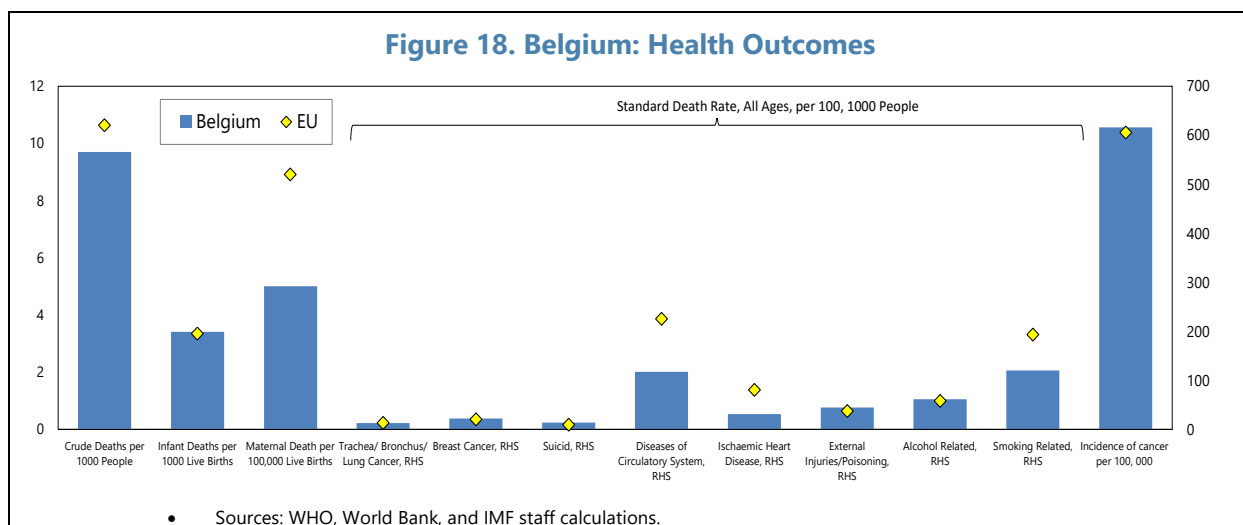
17. In sum, due to aging, Belgium spending on pensions will continue to increase significantly and rapidly, requiring additional policy measures. The projected increase in pension spending is larger than for EU peers. Moreover, the EC (2021 Ageing Report) and the national (2023 report of the Study Committee on Aging) projections concur that pension spending during the current decade will increase by 1¾ percent of GDP. Therefore, additional spending containment measures are needed to avoid that the increase in pension spending crowds out productive public spending and hampers fiscal consolidation. To ensure the sustainability of the pension system and its important role in the Belgian social model, an increase in social contributions could also be considered although it would risk running against the objective of reducing labor taxation.

¹⁵ This increase is incorporated in the baseline.

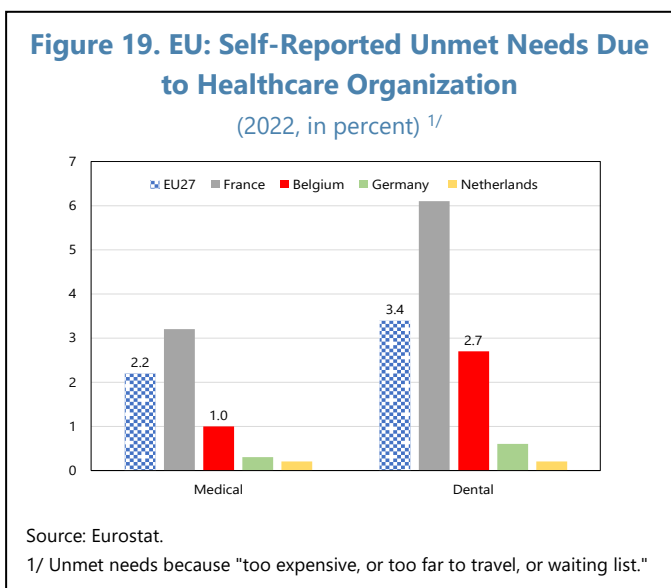
D. Increasing Spending Efficiency to Mitigate the Impact of Aging on Healthcare Costs

Good Health Outcomes, Achieved at a Relatively High Cost

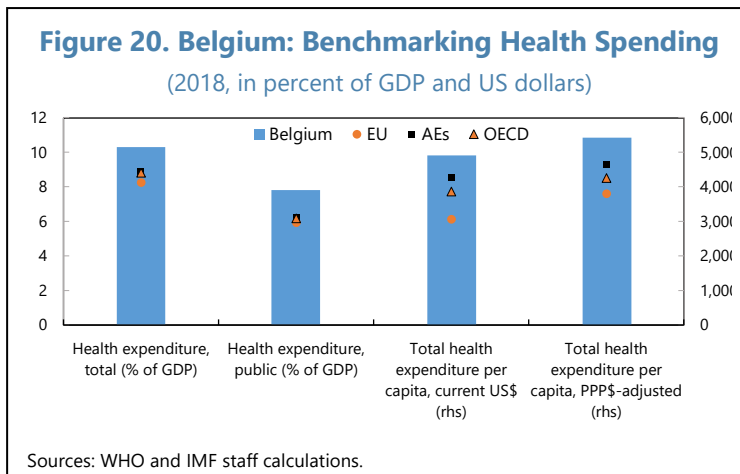
18. Health outcomes are good in relation to peers. Against most metrics, health outcomes compare well to EU averages (Figure 18). Moreover, self-reported unmet needs are lower than for the EU as a whole although higher than in Germany and The Netherlands (Figure 19), and self-perception of health is, for all income quintiles, better than for the EU, France, Germany, or The Netherlands.



19. Health spending in Belgium is relatively high. Whether considered as a share of GDP or per capita, Belgium public health spending is significantly larger than EU, OECD, or advanced economies averages. It is also larger than large neighboring EU countries except France (Figures 20 and 21). Since 2000, public health spending increased less than total health spending (by 2.3 percent of GDP vs. 3.0 percent of GDP). Notably, from the Global Financial Crisis to the COVID-19 pandemic, public health spending ratios (to GDP and to general government spending) have remained broadly constant and remained in line with EU peers (Figures 21 and 22).

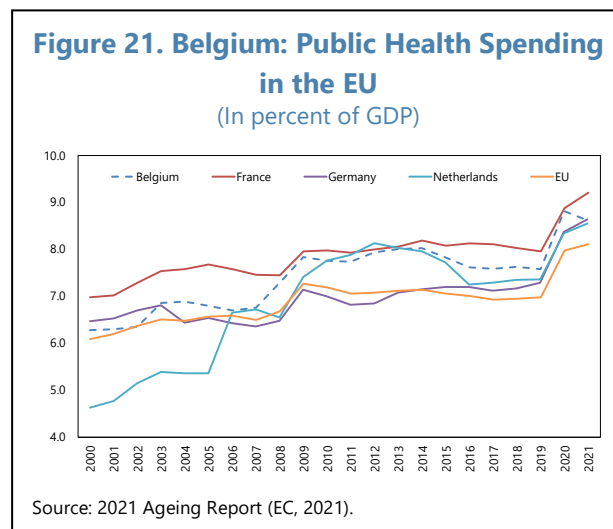


20. Aging is putting health expenditure under pressure. The healthcare system already faces the impact of aging: people 65 years and over represent 1/5th of the population but account for half of healthcare expenses. Moreover, elderly people tend to suffer from multimorbidity, and people with chronic (multi)morbidity, who represent 29 percent of population, account for 65 percent of healthcare expenses (Van der Heyden, 2023).

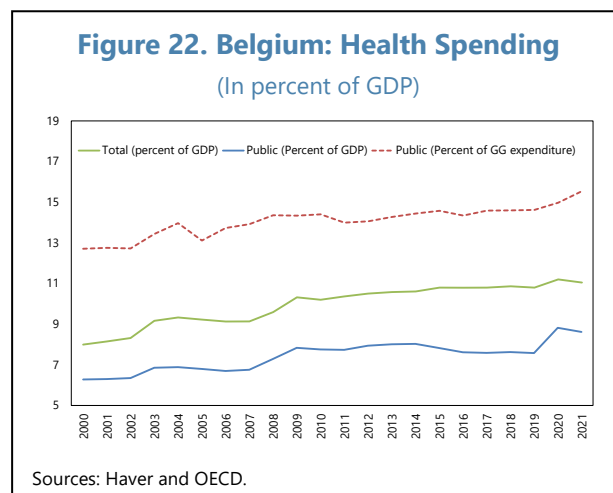


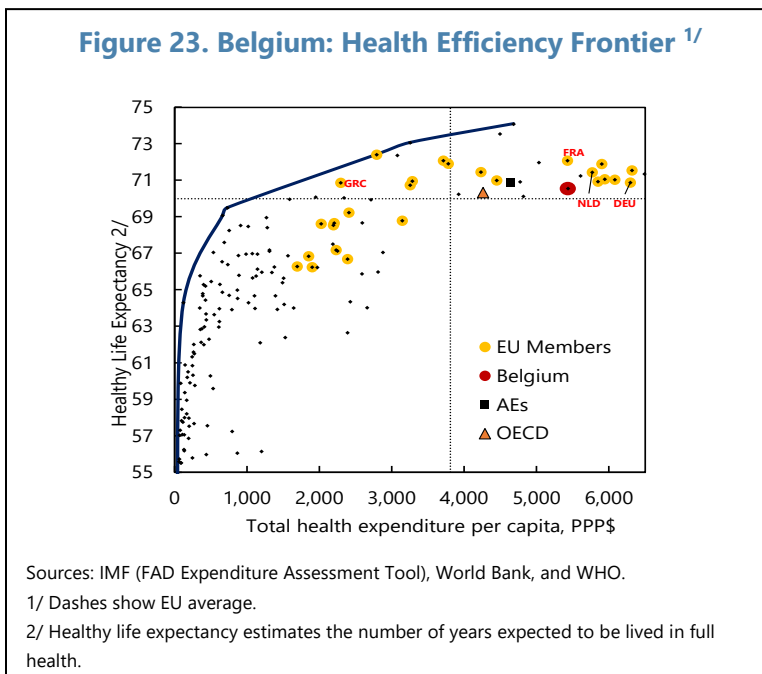
Efficiency Gains Could Free Resources to Absorb Part of the Expected Cost of Aging

21. Potential efficiency gains appear large. Belgium achieves a healthy life expectancy that is only marginally higher than the EU or the OECD but at a substantially higher spending per capita (Figure 23). If Belgium’s healthcare system was as efficient as in the EU and the OECD average, it could achieve the same outcome 20 to 30 percent more cheaply (Table 5).



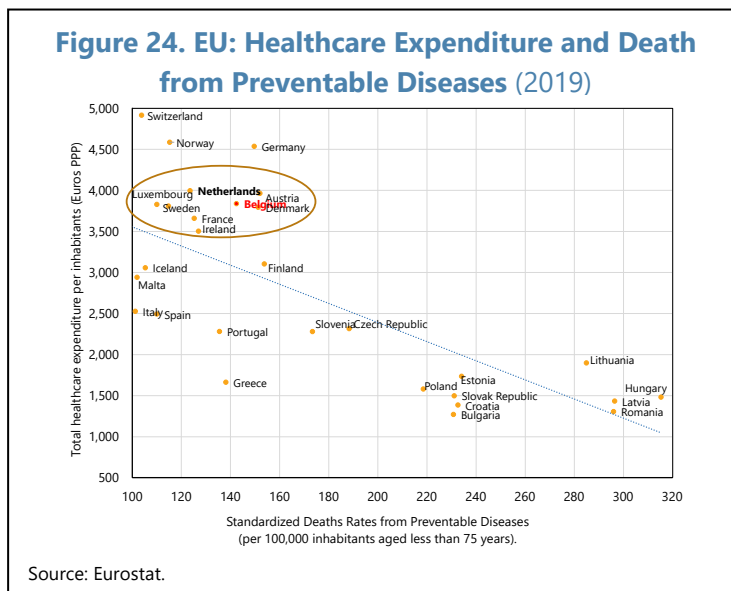
22. A combination of measures can help increase efficiency. Based on Belgium (KCE, INAMI-RIZIV, Sciensano) and international studies (EC, OECD, WHO) as well as academic literature, four types of measures are likely to have the largest impact on efficiency: (1) increasing prevention, (2) fostering a more adequate use of resources, (3) reducing the cost of pharmaceuticals, and (4) reducing reliance on hospitals. In some areas, policies are being implemented, but they need to be scaled up (Gerkens and Merkur, 2020).





Prevention

23. Belgium’s healthcare system is better at treating diseases than at preventing them. For example, Belgium has a higher rate of preventable deaths than other EU countries with a similar level of health expenditure (Figure 24). Another illustration is the case of cancers, which is important in the context of aging as, for many cancer types, the risk of developing the disease rises with age. Illustrating the effectiveness of the healthcare system at curing diseases, Belgium has a relatively higher incidence of cancer than the EU average but a lower death rate from cancer (Figure 25).



24. Spending on prevention is low. At 1.6 percent of all spending in 2019, spending on prevention is lower than the EU average of 2.9 percent. Only 61 euros PPP per capita is dedicated to prevention which is 40 percent lower than EU average of 102 euros PPP per capita (OECD / Observatory on Health System and Policies, 2021). Therefore INAMI-RIZIV (2022a) sees prevention as one of the “highly problematic areas” of the Belgian healthcare system, flagging “alarming indicators”.

Table 5. Belgium: Saving from Efficiency Gains

(In percent of total health spending)

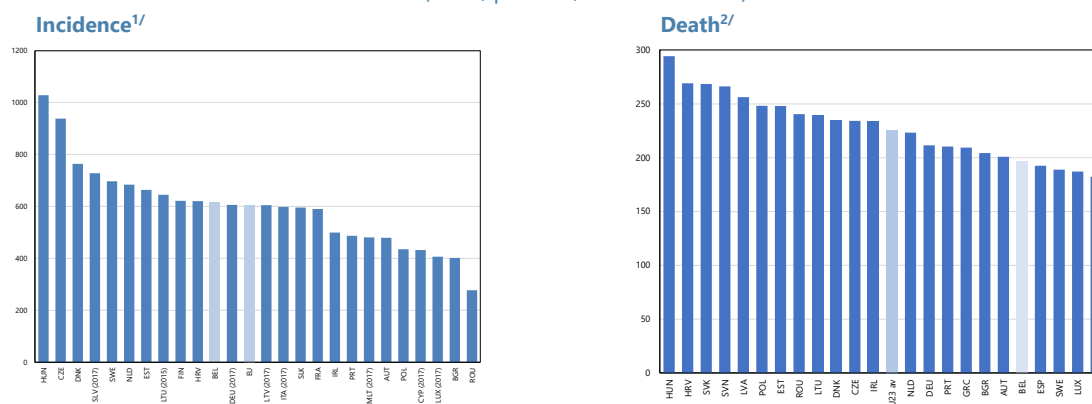
	Healthy Life Expectancy		Total health expenditure per capita, PPP\$		Efficiency gains
	Value	Year	Value	Year	
Belgium	70.6	2019	5434.4	2018	
EU	70.0	2019	3809.1	2018	-29%
OECD	70.3	2019	4259.1	2018	-21%

Sources: World Bank, WHO, and IMF staff calculations.

25. Increasing spending on prevention would not only improve the population well-being but would also be cost effective. For example, although the screening of breast cancer is more developed than the screening of other form of cancers (OECD / Observatory on Health System and Policies, 2021), INAMI-RIZIV (2022a) sees it as “sub-optimal” as the share of the population screened remains below the threshold needed to an acceptable cost/effectiveness ratio. Prevention should focus on risk factors that have a significant impact on health, such as obesity (De Pauw and others 2022; Gerkens and Merkur, 2020). The fight against overweight and obesity would be cost effective as average total healthcare expenses for people with overweight and obesity were significantly higher than those observed in the rest of the population, resulting in additional annual healthcare cost estimated by Gorasso and others (2022) at 0.6 percent of GDP. In addition, comorbidity related to obesity and overweight result in increased absenteeism that cost the Belgian economy an estimated 0.2 percent of GDP.

Figure 25. EU: Incidence of and Death from Cancers

(2018, per 100,000 inhabitants)



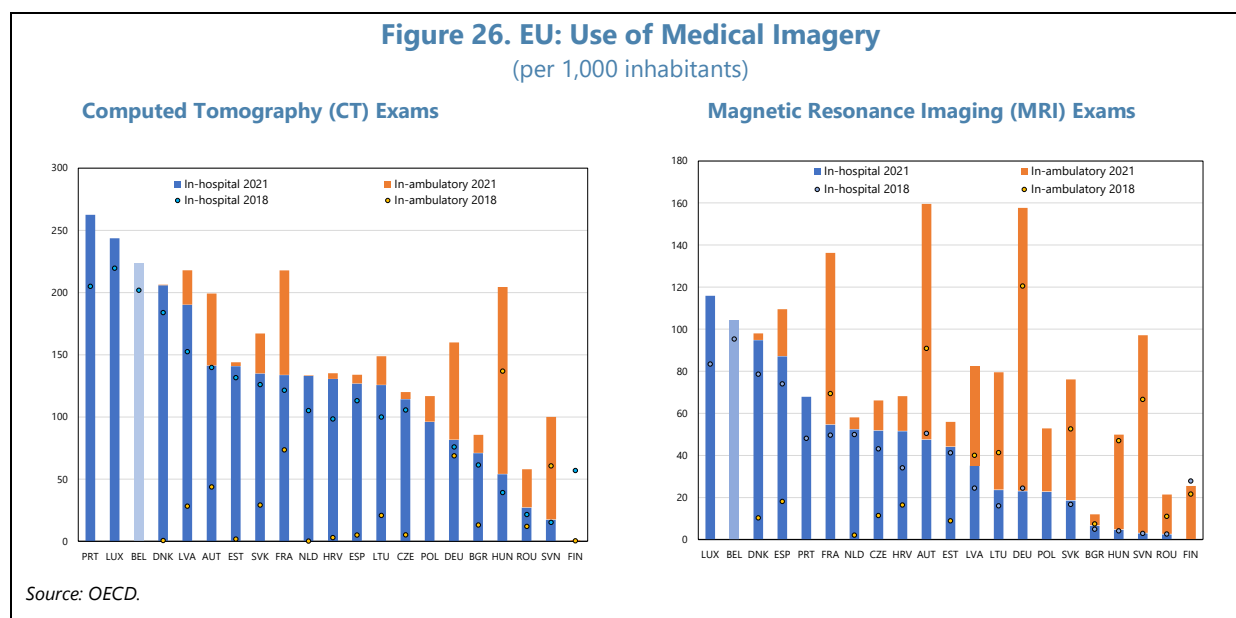
Sources: WHO, OECD, and IMF staff calculations.

1/ No data for Greece and Spain.

2/ Data for Croatia is 2019.

Appropriate Use of Resources

26. Numerous studies suggest that health resources are not optimally used in Belgium. For example, breast cancer screening is not yet sufficiently widespread to be cost effective, but age groups that are not part of the target group are overrepresented in the population screened (Devos et al., 2019; INAMI-RIZIV, 2022a). Reducing unjustified variations in medical practices (documented on the government website [Healthybelgium.be](https://www.health.belgium.be)) could also reduce healthcare cost without affecting health outcome. In some cases, it could even improve health outcomes. For example, studies make a case for reducing the overuse of antibiotics and psychotropics, and for correcting the inadequate prescription of antidepressants and anticholinergic drugs (Devos et al., 2019; Gerkens and Merkur, 2020; HealthyBelgium, 2022; INAMI-RIZIV, 2022a).¹⁶ Also, medical imagery appears to be used more than in peers (Figure 26) and in some cases (e.g., scanner of lumbar spine) is sometimes medically unnecessary (INAMI-RIZIV, 2022a).

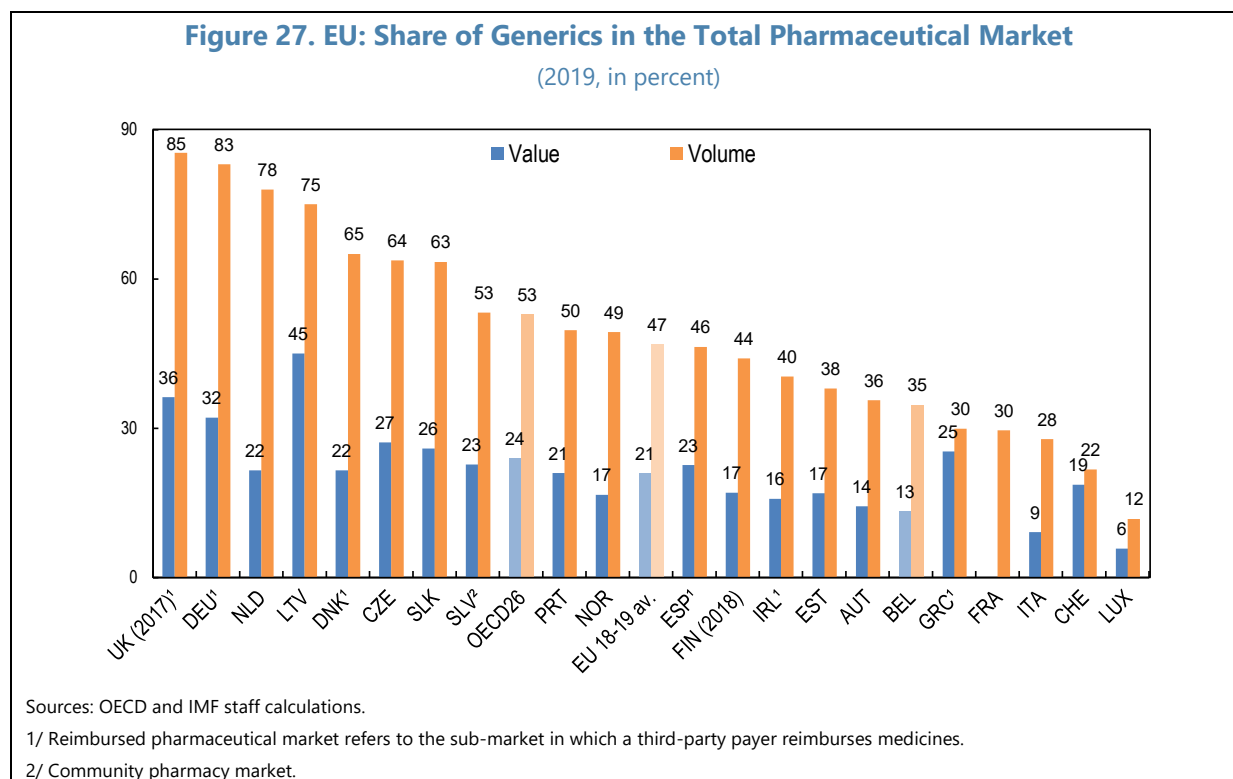


Pharmaceutical

27. Promoting the use of generics could result in savings. Despite policies put in place (e.g., incentives for physicians to prescribe a certain percentage/quota of low-cost medicine and the convention to stimulate the use of biosimilars - Gerkens and Merkur, 2020), the use of generics remains low, with a share both in volume and in value low when compared to other countries (Figure 27). The share of generics is particularly low in hospitals where it accounts for 3.5 percent in value and 17.5 percent in volume compared to 17.5 percent and 44.2 percent, respectively, in six other EU countries for which data are available. In this context, the conclusion of an official working

¹⁶ The tendency of prescribing antidepressants for a duration shorter than the recommended minimum has been documented (INAMI-RIZIV, 2022a).

group that recently reviewed the "purchasing policy" for medicines in hospitals may lead to measures to ensure that generics are part of the hospital tenders.



28. Increasing competition could also reduce the cost of pharmaceuticals. The cost of pharmaceuticals can be reduced by increasing competition in retail. Community and hospital pharmacies have a monopoly for distribution of pharmaceuticals (prescription and over the counter). As a result, pharmaceuticals are not available via supermarkets, and internet sale is only possible for registered over-the-counter pharmaceuticals if a pharmacy owns the website (Gerken and Merkur, 2020). Reducing the cost of drugs through greater competition would improve access to healthcare as pharmaceuticals is an important share of out-of-pocket spending (OECD / Observatory on Health System and Policies, 2021).

29. A review of the price-setting mechanism and greater transparency are warranted. In some cases, the price of drugs can be negotiated bilaterally between the authorities and the pharmaceutical producer (managed entry agreements or MAEs). Most of the time, MAEs include financial compensation mechanisms that are confidential. The share of pharmaceuticals under MAEs increased from 13 percent of expenditure in 2014 to 31 percent in 2018, leading Gerken and Merkur (2020) to conclude that they "have become the rule rather than the exception" and that "the exponential increase in the price of innovative treatments and the lack of transparency in confidential price agreements threaten the system."

Reliance on Hospital

30. Hospital services is an important reason why Belgium spends more than peers on healthcare. In 2019, the difference in public health spending between Belgium and the EU27 was entirely due to the difference in spending in hospital services. More than half of the increase in public healthcare spending during the pandemic was related to hospital services, compared to slightly over 35 percent in the EU and 27 percent in the EU14. As a result, in 2021, 49 percent of public health spending was on hospital services; 7 ppts more than in the EU27 and 3 ppts more than in the EU14 (Table 6).

Table 6. Belgium: Spending on Hospitals

(In percent of GDP)^{1/}

	Public Health Spending			Hospital Services		
	Belgium	EU27	EU14	Belgium	EU27	EU14
2019	7.6	7.0	6.9	3.6	3.0	3.3
2021	8.6	8.1	7.8	4.2	3.4	3.6

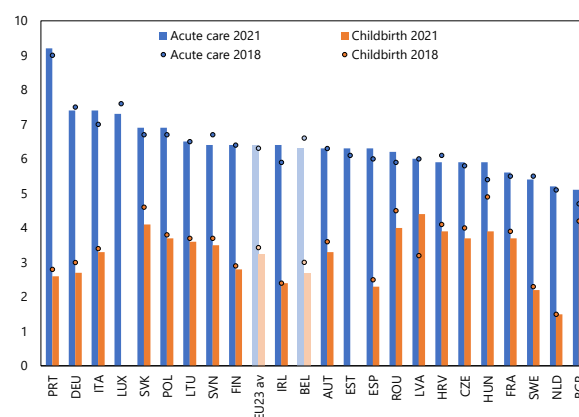
Sources: Eurostat, and IMF staff calculations.

1/ EU14 are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Republic of Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and Sweden.

31. High usage of hospitals is partly related to financial incentives and hospital organization. The reimbursement system provides patients incentives to use hospitals services. This contributes to a rate of avoidable hospital admissions that, though declining, remains higher than in many other EU countries. Avoidable hospitalization for some diseases, such as asthma or chronic obstructive pulmonary disease, is higher than EU average, highlighting that there is room to improve primary care to manage chronic diseases (OECD / Observatory on Health System and Policies, 2021).¹⁷ It also points to the importance of developing integrated care

Figure 28. EU: Length of Hospital Stay

(Average in days)^{1/}



Source: OECD.

1/ No data for Estonia and Luxembourg on length of stay for childbirth. Data for Bulgaria length of stay for acute care is for 2019 not 2018.

¹⁷ In 2015, at least 632 hospital admissions per 100 000 inhabitants could have been avoided. This is less than in 2012 (660 per 100 000 inhabitants) but slightly over EU15 average of 621 per 100 000 inhabitants (Gerken and Merkur).

and removing financial obstacles for hospital and patients (complex payment rules and lack of transparency) to day-hospitalization. These policies would also help continue reducing the average length of stay (Figure 28) and health costs, as all other things being equal, a shorter stay reduces the cost per discharge and shifts care from inpatient to less expensive post-acute settings.

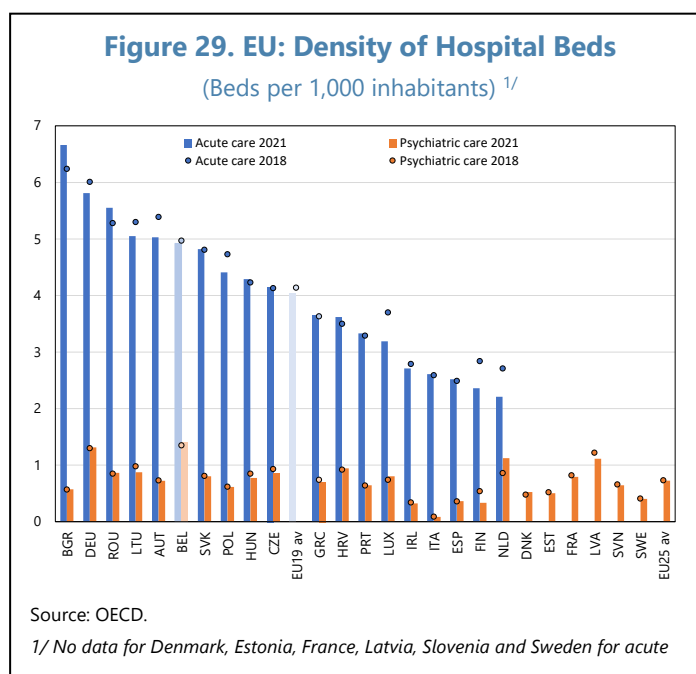
The Healthcare System Needs to Evolve to Prepare for the Challenges of Aging

32. Policies to increase efficiency will free resources that should be, at least partly, used to prepare the health system to the medical challenges related to aging patients. Because healthcare needs of elderly patients differ from the needs of younger patients, aging has large quantitative and qualitative implications that require reforms of the healthcare system. The main adjustments concern hospital organization, human resources, and long-term care needs.

Preparing Hospitals to the Challenges of Aging

33. Aging will increase demand for hospital services. Elderly patients' use of hospital services is already high and expected to increase in the future.¹⁸ Moreover, elderly patients are usually associated with a higher risk of admission through the emergency department and with a longer hospital stay (De Foor and others, 2020; Deschodt, and others, 2015; Van de Voorde and others, 2017; Vilpert and others, 2013).

34. The expected increase in demand for hospital services requires a reorganization of hospitals to mitigate its cost. Belgium has a higher density of hospital beds than most EU countries (Figure 29), but they need to be reoriented toward geriatric units. Overall, the healthcare system has a longstanding over-capacity in most types of beds but an under-capacity in geriatrics (Deschodt, and others, 2015; Van de Voorde and others, 2017). As a result, in 2011, more than a quarter of hospitalized patients older than 75 were in non-geriatric acute care units, and they accounted for 43 percent of all hospitalization days on acute non-geriatric units (Deschodt, and others, 2015). In the short term, given the decline in the projected need for traditional beds, reconvertng some of the pediatric and maternity, surgical or internal medicine beds into geriatric beds would reduce the fiscal cost of increasing capacity for geriatric care (Van de Voorde



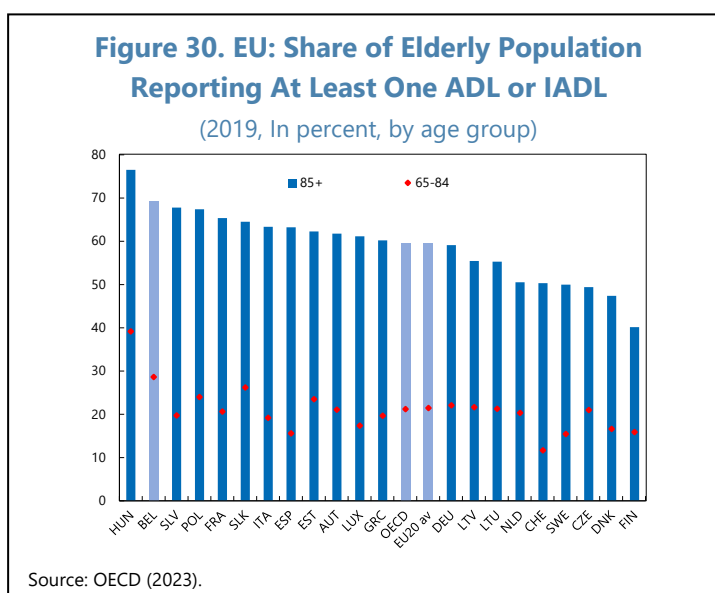
¹⁸ For example, patients 85 and older already represented 9.2 percent of hospital patients in 2011 and 16¼ of hospitalization (Deschodt, and others, 2015).

and others, 2017; Gerkens and Merkur, 2020). In the long run, however, the expected increase in need for geriatric beds is expected to grow too rapidly to be met by reconverting other facilities or policies to increase in care at home (both formal and informal care) so that additional fiscal costs seem unavoidable (HealthyBelgium, 2022).

35. The expected increase in demand for hospital services also requires a reorganization of medical processes, which may imply a fiscal cost, and increased cooperation. Van de Voorde and others (2017) recognize that a substantial share of elderly patients is not admitted in geriatric units due to capacity problems but also because elderly patients are often admitted for several medical reasons, some of them treated in non-geriatric units. As elderly patients suffer more from comorbidities than younger patients, their treatment is complex and will imply—in addition to a greater utilization and reorganization of hospital resources and medical processes—a need for efficient coordination. This coordination goes beyond hospitalization as patient stay in hospital can be prolonged if the discharge is delayed due to a lack of coordination with rehabilitation institutions or nursing homes (De Foor and others, 2018). This also highlights that, to reduce the aging pressure on hospitals, investment in long term care facilities is needed.

36. Prevention policies could mitigate the cost of aging.

Increasing spending on prevention could help mitigate the cost of aging if it allows the elderly to maintain healthier living for longer. Belgium has room for improvement as the share of elderly population in need of care is among the highest in Europe (Figure 30). In this context, it is important to note that the health status of an elderly at a certain age may be better in several decades than it is now, which could significantly lower the cost of aging (Kotschy and Bloom, 2023).

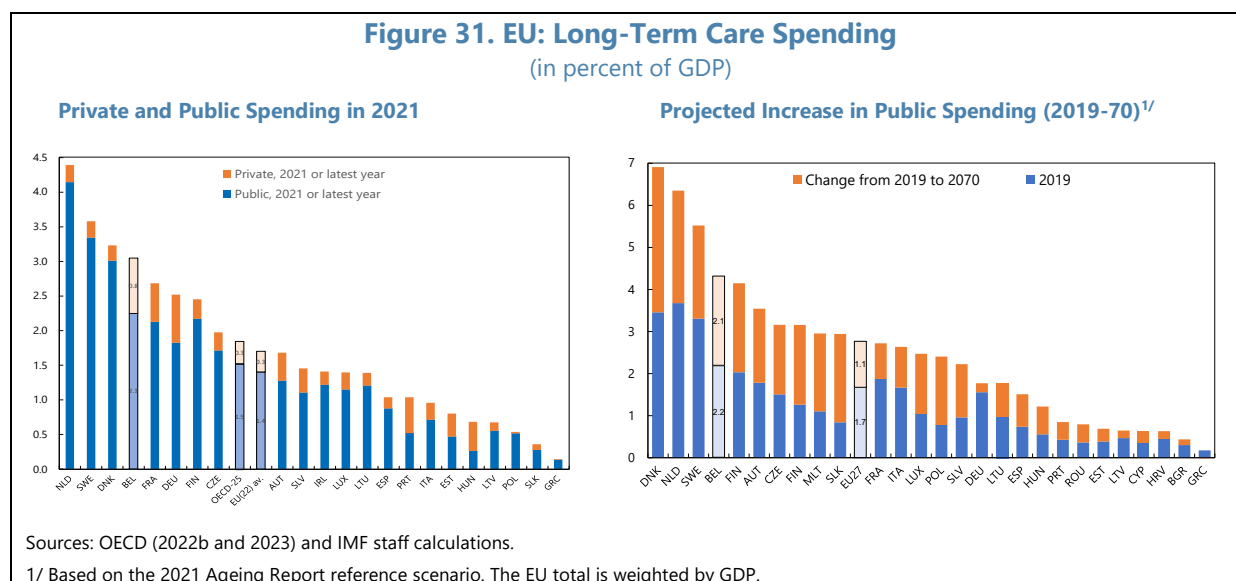


Ensuring an Adequate Geriatric-Support Workforce

37. The health need of an aging population will require different skills from physicians and nurses. Belgium already faces a shortage of physicians and nurses with geriatric skills and expertise in elderly care. This shortage will grow as the number of elderly patients increases and aging intensity rises (Figure 3). Therefore, although they imply a cost in the short-term, training policies need to be implemented rapidly so that the increase in geriatric demand is met and that the increased hospital capacity is staffed by a sufficient and qualified geriatric workforce (Van de Voorde and others, 2017).

Ensuring Adequate Long-Term Care

38. Public spending on long-term care is already comparatively high and projected to increase significantly. Despite more prevalent informal long-term care than in other OECD countries (OECD, 2017; Devos and others, 2019) and a long-standing policy to develop at-home care services (HealthyBelgium, 2022), which both tend to postpone institutionalization, public spending on long-term care is among the highest in Europe (Figure 31). Based on the reference scenario of the 2021 Ageing report, the OECD (2023) projects that the public spending on long-term care would increase by about 2 percent of GDP by 2070. Such an increase poses again the fiscal and operational challenge to increase long-term capacities both in terms of beds and in term of adequate staffing.



E. Conclusion

39. Belgium's rapid population aging constitutes an important fiscal challenge. As all available projections point to a substantial increase in the cost of aging in the current decade, the sustained fiscal consolidation needed to reduce the debt level and rebuild buffers post-COVID will face significant headwinds.

40. Belgium spending on pension is increasing significantly and rapidly, requiring additional policy measures. Pension spending is projected to increase faster than for EU peers. Notably, EC and national projections concur that pension spending during the current decade will increase by 1¾ percent of GDP. Therefore, additional spending containment measures (increase labor force participation, notably of older workers, tighten eligibility conditions, avoid an increase in the generosity of pensions) are needed now to allow a meaningful fiscal consolidation over the coming years. To ensure the sustainability of the pension system and its important role in the Belgian social model, an increase in social contributions could also be considered though it would run against the policy of reducing labor taxation.

41. Aging is a significant challenge for the healthcare system, but efficiency gains could help absorb part of the aging cost. Access to healthcare and health outcomes are comparatively good in Belgium. However, they are achieved at a relatively high cost, suggesting large potential efficiency gains. Realizing these efficiency gains will require significant reforms—more emphasis on prevention, reforming the organization and role of hospitals, promoting the use of generic drugs, and ensuring a more appropriate use of costly healthcare resources—that would free resources. These resources could help absorb part of the projected increase in fiscal spending on health (including long-term care) but also to prepare the health system to the medical challenges related to aging patients. Indeed, because healthcare needs of elderly patients differ from the needs of younger patients, aging has large implications that require costly reforms. The main reforms concern hospital organization and human resources, as well as preparing for the increased demand for long-term care.

References

- Bureau fédéral du Plan / Conseil Supérieur des Finances (2023). *Comité d'étude sur le vieillissement - Rapport annuel 2023*, Brussels, 89 p., <https://www.plan.be/publications/publication-2370-fr-comite-d-etude-sur-le-vieillessement-rapport-annuel-2023>.
- De Foor, Julie, Christelle Senterre, Pol Leclercq, Dimitri Martins, and Magali Pirson (2020). "Profile of hospitalised elderly patients in Belgium—Analysis of factors affecting hospital costs," *The Journal of Economics of Ageing*, Vol. 15, 9 p.; <https://doi.org/10.1016/j.jeoa.2019.100209>.
- De Pauw, Robby, Manu Claessens, Vanessa Gorasso, Sabine Drieskens, Christel Faes, and Brecht Devleesschauwer (2022). "Past, present, and future trends of overweight and obesity in Belgium using Bayesian age-period-cohort models," *BMC Public Health*, 22, 1309, 14 p., <https://doi.org/10.1186/s12889-022-13685-w>.
- Deroose, Marjolein, Wim Melyn, Pierrick Stinglhamber, and Stefan Van Parys (2023). "Is public spending in Belgium sustainable? A comparison with other euro area countries," *NBB Economic Review*, 2023 No. 9, 30 p., https://www.nbb.be/doc/ts/publications/economicreview/2023/ecorevi2023_h09.pdf.
- Deschodt Mieke, Claes Veerle, Bastiaan Van Grootven, Koen Milisen, Benoît Boland, Johan Flamaing, Alain Denis, François Daue, Lut Mergaert, Carl Devos, Patriek Mistiaen, Koen Van den Heede (2015). *Comprehensive Geriatric Care in Hospitals: The Role of Inpatient Geriatric Consultation Teams*. Brussels: Belgian Health Care Knowledge Centre, KCE Report 245, 127 p., https://kce.fgov.be/sites/default/files/2021-12/KCE_245_geriatric_care_in_hospitals_Report_0.pdf
- Devos, Carl, Audrey Cordon, Mélanie Lefèvre, Caroline Obyn, Françoise Renard, Nicolas Bouckaert, Sophie Gerkens, Charline Maertens de Noordhout, Brecht Devleesschauwer, Margareta Haelterman, Christian Léonard, and Pascal Meeus (2019). *Performance of the Belgian Health System – Report 2019*. Brussels: Belgian Health Care Knowledge Centre, KCE Report 313, 109 p., <https://kce.fgov.be/node/1783>.
- Duc, Cindy (2015), *Les réformes des retraites depuis 1993 augmentent à terme l'âge moyen de départ de deux ans et demi*, Paris : Direction de la Recherche, des Etudes, de l'Evaluation et des Statistiques, 6 p.
- European Commission (2021). *The 2021 Ageing Report - Economic and Budgetary Projections for the EU Member States (2019-2070)*, Luxembourg: Publications Office of the European Union, Institutional Paper 148, 375 p., https://economy-finance.ec.europa.eu/publications/2021-ageing-report-economic-and-budgetary-projections-eu-member-states-2019-2070_en.
- _____ (2022). *Fiscal Stability Report 2022*, Luxembourg: Publications Office of the European Union, Institutional Paper 171, 2 volumes.
- Eurostat (2019). *European system of integrated social protection statistics — ESSPROS — Manual and user guidelines*, Luxembourg: Publications Office of the European Union, 157 p., <https://ec.europa.eu/eurostat/documents/3859598/10295301/KS-GQ-19-014-EN-N.pdf/e7c8c019-944c-1c71-ae5-1ffc8ce45200?t=1673940032376>.
- Gorasso, Vanessa, Isabelle Moyersoen, Johan Van der Heyden, Karin De Ridder, Stefanie Vandevijvere, Stijn Vansteelandt, Delphine De Smedt, and Brecht Devleesschauwer (2022). "Health care costs and lost productivity costs related to excess weight in Belgium," *BMC Public Health*, 22, 1693, 112 p., <https://doi.org/10.1186/s12889-022-14105-9>.

- Gerkens, Sophie and Sherry Merkur (2020). *Belgium - Health System Review*, Health Systems in Transition, vol. 22(5), 237 p.
- Hallaert, Jean-Jacques and Maximilien Queyranne (2016). *From Containment to Rationalization: Increasing Public Expenditure Efficiency in France*, Washington, D.C.: IMF, Working Paper 16/7, 65 p.
- HealthyBelgium (2022). *Care for the elderly*. Belgium.be Official information and services, <https://www.healthybelgium.be/en/health-system-performance-assessment/specific-domains/care-for-the-elderly>.
- IMF (2019). *Belgium - 2019 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for Belgium*. Washington, D.C.: IMF, IMF Country Report 19/74, 64 p.
- ____ (2020). *Belgium - 2020 Article IV Consultation—Press Release; Staff Report; Staff Supplement; and Statement by the Executive Director for Belgium*. Washington, D.C.: IMF, IMF Country Report 20/91, 68 p.
- INAMI-RIZIV (2022a). *Vers un budget pluriannuel pour les soins de santé et des objectifs 'soins de santé'*. Brussels: INAMI-RIZIV, Rapport du Comité scientifique budget pluriannuel, 122 p.
- Kotschy, Rainer and David E Bloom (2022). "A comparative perspective on long-term care systems," *International Social Security Review*, vol. 75(3-4), pp. 47–69, <https://doi.org/10.1111/issr.12307>.
- ____ (2023). *Population Aging and Economic Growth: From Demographic Dividend to Demographic Drag?*, Cambridge, MA: NBER, Working Paper 31585, 27 p.
- Lefèbvre, Mathieu (2006). *Population ageing and consumption demand in Belgium*, Liège: Université de Liège, Centre de Recherche en Economie Publique et de la Population (CREPP), Working Paper 0604, 20 p., <https://www.researchgate.net/publication/24125196>.
- Lindert, Peter H. (2021). *Pensions and the Curse of Long Life*. Chapter 12 in "Making Social Spending Work," Cambridge: Cambridge University Press, 422 p.
- OECD (2017). *Health at a Glance 2017 – OECD Indicators*. Paris: OECD, 215 p.
- ____ (2022a). *Economic Surveys: Belgium*, Paris: OECD, 122 p.
- ____ (2022b) *Health at a Glance: Europe 2022 - State of Health In The EU Cycle*. Paris: OECD, 222 p.
- ____ (2023). *Beyond Applause - Improving Working Conditions in Long-Term Care*. Paris: OECD, 199 p.
- OECD / European Observatory on Health Systems and Policies (2021). *Belgium: Country Health Profile 2021, State of Health in the EU*, Paris: OECD, 23 p.
- Statbel (2023). *Perspectives démographiques 2022-2070*. Brussels: Statistics Belgium – Federal Public Service Economy, SMEs, Self-employed and Energy; accessed September 11, 2023, <https://statbel.fgov.be/fr/themes/population/perspectives-de-la-population>.
- Van de Voorde, Carine, Koen Van den Heede, Claire Beguin, Nicolas Bouckaert, Cécile Camberlin, Piet de Bekker, Noémie Defourny, Harlinde De Schutter, Carl Devos, Sophie Gerkens, Cai Grau, Patrick Jeurissen, Florian Margareth Kruse, Mélanie Lefèvre, Yolande Lievens, Patriek Mistiaen, Aude Vaandering, Elisabeth Van Eycken, Ewout van Ginneken (2017). *Required hospital capacity in 2025 and criteria for rationalisation of complex cancer surgery, radiotherapy and maternity services*. Brussels: Belgian Health Care Knowledge Centre (KCE), KCE Report 289, 550 p., <https://doi.org/10.57598/R289C>.

Van der Heyden, Johan, Herman Van Oyen, Nicolas Berger, Dirk De Bacquer, and Koen Van Herck (2015). "Activity limitations predict health care expenditures in the general population in Belgium," *BMC Public Health*, 15, 267, 12 p., <https://doi.org/10.1186/s12889-015-1607-7>.

_____ (2023). *Evolution of Health Care Costs In Belgium Between 2013 and 2020 Across Different Socio-Economic Strata*, Presentation to the IMF mission, 6 p.

Vilpert, Sarah, Hélène Jaccard Ruedin, Lionel Trueb, Stéphanie Monod-Zorzi, Bertrand Yersin, Christophe Büla (2013). "Emergency department use by oldest-old patients from 2005 to 2010 in a Swiss university hospital," *BMC Health Service Research*, 13, 344, 8 p.