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Projecting OECD Health and Long-Term Care Expenditures: What Are the Main Drivers?

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ABSTRACT/RESUMÉ

Projecting OECD health and long-term care expenditures: What are the main drivers?

This paper proposes a comprehensive framework for projecting public heath and long-term care expenditures. Notably, it considers the impact of demographic and non-demographic effects for both health and long-term care. Compared with other studies, the paper extends the demographic drivers by incorporating death-related costs and the health status of the population. Concerning non-demographic drivers of health care, the projection method accounts for income elasticity and a residual effect of technology and relative prices. For long-term care, the effects of increased labour participation, reducing informal care, and wage inflation are taken into account. Using this integrated approach, public health and long-term care expenditure are projected for all OECD countries for the years 2025 and 2050. Alternative scenarios are simulated, in particular a 'cost-pressure' and 'cost-containment' scenario, together with sensitivity analysis. Depending on the scenarios, the total health and long-term care spending is projected to increase on average across OECD countries in the range of 3.5 to 6 percentage points of GDP for the period 2005-2050.

JEL Classification: H51, I12, J11, J14

Key words: Public health expenditures, long-term care expenditures, ageing populations, longevity, demographic and non-demographic effects, projection methods.

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Cette étude propose un cadre assez complet pour effectuer des projections de dépenses de soins de santé et de soins de long terme. Notamment, à la fois pour les dépenses de santé et les soins de long terme, les effets des facteurs démographiques et non démographiques sont considérés dans l'analyse. En comparaison avec d'autres études, les effets démographiques ont été élargis pour incorporer les coûts liés à la mortalité et à l'état de santé de la population. Pour ce qui concerne les facteurs non démographiques des dépenses de santé, la méthode de projection incorpore un effet d'élasticité-revenu et l'effet résiduel de la technologie et des prix relatifs. Pour les soins de long terme, l'effet d'une participation accrue dans le marché du travail diminuant l'offre de soins informels, et de l'inflation des salaires ont été pris en compte. Sur la base de cette approche intégrée, les dépenses publiques de santé et des soins de long terme sont projetées pour tous les pays de l'OCDE et pour les années 2025 et 2050. Des scénarios alternatifs ont été simulés, en particulier un "scénario de pression sur les coûts" et un "scénario de contention des coûts", ainsi qu'une analyse de sensitivité. En fonction des scénarios, le total des dépenses de santé et des soins de long terme est projeté d'augmenter pour la moyenne de l'OCDE entre 3.5 et 6 points de PIB pour la période 2005-2050.

Classification JEL: H51, I12, J11, J14

Mots clefs: dépenses publiques de santé, dépenses publiques de soins à long terme, vieillissement de la population, longévité, effets démographiques et non démographiques, méthodes de projection.

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FOREWORD

Rising expenditure on health and long-term care is putting pressure on government budgets in most OECD countries. Going forward, these pressures will add to those arising from insufficiently reformed retirement schemes. The question is how much health and long-term care spending could increase in the future and what policy can do about it. This paper presents a framework for thinking about that question and provides some quantitative illustrations. Both changing demography and non-demographic drivers of spending are taken into account.

The paper shows that spending on health and long-term care is a first-order policy issue. Between now and 2050, public spending on health and long-term care could almost double as a share of GDP in the average OECD country in the absence of policy action to break with past trends in this area. And that estimate takes into account that as people live longer, they also remain in good health for longer. Even with containment measures, public spending on health and long-term care could rise from the current average level of 6-7 % of GDP to around 10% by 2050. In some countries, the increase could be dramatic.

Despite the orders of magnitudes involved, policy discussion in many countries has focused less on health and long-term care spending than on pension and transfer spending. There can be many reasons for that. One is possibly that pension spending is analytically more easily tractable than is the case for health and long-term care. Another is that the policy instruments to address pension spending are more readily identifiable. A third is that it is easier in the case of pensions to identify benchmarks for assessing what constitutes reasonable spending levels and sensible incentives to private sector actors. Whatever the reasons, the results in this paper illustrate that the policy environment for health and long-term care spending is of primordial importance.

The work behind this report was undertaken by a team led by Joaquim Oliveira Martins and comprising also Christine de la Maisonneuve and Simen Bjørnerud. As usual in our work, a preliminary version of the report was discussed by OECD government representatives. They provided many helpful comments, but the responsibility for the final product of course lies with the OECD Secretariat.

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Chief Economist

PROJECTING OECD HEALTH AND LONG-TERM CARE EXPENDITURES: WHAT ARE THE MAIN DRIVERS?

1. Summary and main findings

1. Public spending on health and long-term care is a major source of fiscal pressures in most OECD countries, amounting to, on average, some 7% of GDP in 2005. Evolution has been uneven over time: following rapid growth during the 1970s, public spending slowed down for several decades. However, a recent acceleration (Figure 1.1) has raised concern about likely future trends.

[Figure 1.1 Evolution of public and private OECD health spending]

2. This paper attempts to respond to these concerns by considering a number of factors likely to drive public spending on health and long-term care over the period to 2050.[1] In projecting drivers of this spending, two important distinctions are made:

- Expenditures on long-term care and on health care (both preventive and acute) are examined separately,
- For both health and long-term care, the impacts of ageing and non-demographic factors are brought separately into the analysis.

3. The projections rely on a uniform cross-country framework, in contrast with an earlier OECD exercise.[2] The latter essentially gathered country-specific projections, provided by national authorities, produced on the basis of an agreed set of macroeconomic and demographic assumptions. The current projections are more homogeneous, but at the cost of simplifying the description of national health and long-term care arrangements. The main purpose is to bring out in a stylised and tractable way the key mechanisms at work. The inherent uncertainties surrounding this approach are addressed by analysing the sensitivity of the projection results to changes in the assumptions concerning the main drivers of expenditure.

4. In broad terms, the principal forces driving these projections are (see main text for detail):

- *Health care, demographic factors:* a rising share of older age groups in the population will put upward pressure on costs because health costs rise with age. However, the average cost per individual in older age groups should fall over time for two reasons:
  - Longevity gains are assumed to translate into additional years of good health ("healthy ageing); and

1. This paper only deals with public spending. Private spending added another 2% of GDP on average to expenditure on health and long-term care in 2005. While it could be argued that private and public expenditures are not separable, it is implicitly assumed here that private health spending arises from individual choices and, therefore, could be treated like any other consumption item.

2. For details on this earlier project see Dang *et al.* (2001).

  - Major health costs come at the end of life. Insofar as increasing longevity means that more individuals "exit" an age group by living into an older group (rather than "exit" by dying), average costs of the group in question will fall.

- *Health care, non-demographic factors:* health care costs have typically grown faster than income (even as incomes have increased). This is generally held to be due to the effect of technology and relative-price movements in the supply of health services. Disentangling these factors is beyond the scope of current analysis and indeed is dealt with only modestly in the literature. Hence, two scenarios are assumed in the projections here:

  - A "cost pressures" scenario in which it is assumed that, for given demography, expenditures grow 1% per annum faster than income. This corresponds to observed trends over the past two decades.

  - A "cost-containment" scenario in which (unspecified) policy action is assumed to curb this "extra" expenditure growth such that it is eliminated by the end of the projection period (2050).

- *Long-term care, demographic factors:* dependency on long-term care will tend to rise as the share of old people in the population increase. This effect is mitigated somewhat by the likelihood that the share of dependents per older age group will fall as longevity increases due to "healthy ageing".

- *Long-term care, non demographic factors:* expenditures are likely to be pushed up by a possible "cost disease" effect, *i.e.* the relative price of long-term care increasing in line with average productivity growth in the economy because the scope for productivity gains in long-term care is more limited.[3] This effect is assumed to be fully operative in the "cost pressure" scenario but to be partially mitigated[4] by (unspecified) policy action in the "cost containment" scenario.

5. As noted, two main sets of scenarios were simulated, one in which no policy action is assumed, the "cost pressures" scenario, and a "cost-containment scenario" that embodies the assumed effects of policies curbing expenditure growth. As mentioned above, these policies are not modelled explicitly. Finally, sensitivity tests were carried out to assess the robustness of the results to key assumptions.

6. The projections for health and long-term care expenditures yield the following stylised results (Table 1.1):

- In the "cost-pressure" scenario average health and long-term care spending across OECD countries is projected to almost double from close to 7% of GDP in 2005 to some 13% by 2050.

- In the "cost-containment" scenario, average expenditures would still reach around 10% of GDP by 2050,[5] or an increase of 3½ percentage points of GDP.

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3. Note that empirical evidence on the income elasticity of long-term care spending simply does not exist, and in most scenarios it is assumed to be zero.

4. It is arbitrarily assumed that the relative price changes by only half of productivity growth elsewhere in the economy.

5. As a comparison, on the basis of pure demographic effects, Dang *et al*. (2001) concluded that the expenditure on health and long-term care for a group of OECD countries would increase from 6% of GDP in 2000 to 9 to 9½ per cent of GDP in 2050. A similar study by the EC-Economic Policy

- Non-demographic factors (including effects from technology and relative prices) play a significant role in upwards pressure on long-term care expenditures, and indeed are the most important driver of the increase in health-care expenditure.

[Table 1.1 Public health and long-term care spending]

7. These average results hide striking differences across countries (Figure 1.2). In the cost-containment scenario, a group of countries stands out with increases of health and long-term care spending at or above four percentage points of GDP, over the period 2005-50. It includes rapidly ageing countries (Italy, Japan, Spain), countries that will experience a dramatic change in their population structure (Korea, Mexico, Slovak Republic), and countries with currently low labour participation, which may face a substantial increase in the demand for *formal* long-term care (Italy, Ireland, Spain). In contrast, Sweden is in the lowest range with an increase below two percentage points of GDP. This country is in a mature phase of its ageing process and already spends a relatively high share of GDP on health and long-term care.

[Figure 1.2 Total increase in health and long-term care spending, 2005-2050]

8. Despite the uncertainties, sensitivity analysis suggests the results are fairly robust in key respects. For example, under the assumption of "healthy ageing" changes in longevity will have only a modest effect on spending. However, the projections for spending on long-term care are sensitive to the future development of participation rates for the working-age population because higher participation reduces the capacity for "informal" care. An alternative scenario, where participation rates in countries where they are currently low converge towards levels in high-participation countries, has spending on long-term care rising by an additional 1-2% of GDP on average, but much more in some countries.[6]

9. The paper follows the structure displayed in Figure 1.3. It begins with health care expenditure, decomposing demographic and non-demographic expenditure drivers, discusses the main mechanisms at work in each case, and describes the projection framework. Alternative projection scenarios are then presented, followed by a discussion of the sensitivity of the results to key assumptions. The same sequence applies to long-term care expenditures. A glossary of technical terms is provided in Box 1.

[Figure 1.3 Drivers of total health and long-term care spending: key components]

Committee (2001), focusing on the EU15 area, calculated that the expenditure on health and long-term care would increase from 6½ per cent in 2000 to 8½ to 9% in 2050. Calculated in the same way, the ageing effect was estimated to be of comparable size also in Canada (Health Canada, 2001). These orders of magnitude are comparable with the results of the present study, but the underlying drivers are rather different. For an update of the assumptions and projection methodologies see EC-Economic Policy Committee (2005).

6. However, higher participation rates are likely to have positive effects on public budgets which, depending on how they come about, may more than offset the effect via long-term care spending.

Box 1. Glossary of technical terms

Activities of daily living (ADLs)	Self-care activities that a person must perform every day, such as bathing, dressing, eating, getting in and out of bed, moving around, using the toilet, and controlling bladder and bowel.
(Acute) health care	Is distinguished from long-term care in the sense that acute health care aims at changing the medical condition of a person (*e.g.* surgery) while long-term care only compensates for lasting ability.
Baumol effect or 'cost-disease'	Tendency for relative prices of some services, such as long-term care, to increase vis-à-vis other goods and services in the economy, reflecting a negative productivity differential and the equalisation of wages across sectors.
Compression of morbidity	The hypothesis that increases in longevity translate into a shorter share of life lived in relatively bad health.
Death-related costs	Health expenditures incurring at the end of life. One hypothesis proclaims that the apparent rise in health expenditures with age reflects the fact that death is more frequent at higher ages, not merely the fact that people are old and frail. Following this line of thought, the projected fall in mortality will damp the future impact of ageing.
Disability/dependency	Inability to perform one or more ADLs without help. Specific definitions, *i.e.* how many ADLs, differ across countries making comparisons difficult.
Dynamic equilibrium ("healthy ageing")	The hypothesis that the number of years of life lived in bad health remains constant in the wake of increased longevity (or increased life expectancy is translated into additional years in good health).
Expansion of morbidity	The hypothesis that increases in longevity translate into a higher share of life lived in relatively bad health.
Formal long-term care	Long-term care services supplied by the employees of any organisation, in either the public or private sector, including care provided in institutions like nursing homes, as well as care provided to persons living at home by either professionally trained care assistants, such as nurses, or untrained care assistants. Divided into home care and institutional care.
Informal care	Long-term care provided by spouses/partners, other members of the household and other relatives, friends and neighbours. Informal care is usually provided at the home and is typically unpaid.
Long-term care	A range of (often basic) services needed for persons who are dependent on help for carrying out basic ADLs. Divided into formal and informal long-term care where, on average across OECD countries, the latter currently makes up the bigger part.
Morbidity/chronic conditions	A wider concept than disability. Higher levels of disability are generally accompanied by more chronic conditions, but the opposite does not necessarily follow; intensive medical treatment can reduce disability by soothing chronic diseases. This implies that a decline in disability does not necessarily means curtailment in costs. Still, analyses usually focus on disability due to lack of reliable and objective measures of morbidity.
Prevalence of disability/morbidity/ dependency	Number of cases of disability/disease/dependency for a given population for a given time period. Prevalence of disability/morbidity/dependency tends to be more frequent at higher ages.

2. Health care

10. Looking at the recent past, expenditures on health care have increased in terms of their share in GDP. Given that pure demographic factors have so far been weak, this upward trend in spending is probably due to the increased diffusion of technology and relative price changes. Two important questions are then: how will these typically non-demographic drivers behave in the future and will the projected change in demographic trends create additional expenditure pressures?

Projecting demographic drivers of expenditure

11. While the effect of ageing on public health expenditures per capita has been weak in the past,[7] it is commonly expected that it will increase in the future. This assessment is based on the combined effect of the projected increase in the share of old people and the tendency for health expenditures per capita to increase with age.[8]

12. In this study expenditure profiles are a central piece of the projection framework (Figure 2.1). Average health expenditures by age group are relatively high for young children; they decrease and remain stable for most of the prime-age period, and then start to increase rapidly at older ages.[9]

[Figure 2.1 Public health care expenditure by age groups]

13. For any given year, the population can be divided into two segments: the survivors and the non-survivors. Each of these segments of the population has a specific cost curve. The *non-survivors'* cost curve can be estimated by multiplying the estimated costs of death by age group by the number of deaths per age group. In line with evidence that health costs are concentrated in the proximity to death (*i.e.*, they are "death-related"; Seshamani and Gray, 2004; Batljan and Lagergren, 2004), the cost of death was proxied by the health expenditure per capita for the oldest age group (95+) multiplied by a factor (equal to 4 for an individual between 0 to 59 years old and declining linearly to 1 afterwards). The *survivors*' cost curve can then be derived from the difference between the total cost curve and the non-survivor curve (see Annex 2A). An example of this split is given for one country, Finland, in Figure 2.2. Using this framework, health expenditures for survivors and non-survivors can be projected separately in a more meaningful way.

[Figure 2.2 Breakdown of the health care cost curve]

7. See Culyer (1990), Gerdtham *et al.,* (1992), Hitiris and Posnett (1992), Zewifel *et al.* (1999), Richardson and Roberston (1999), Moise and Jacobzone (2003) and Jönsson and Eckerlund (2003).

8. Across all health expenditure types, expenditure on those aged over 65 is around four times higher than on those under 65. The ratio rises to between six to nine times higher for the older groups (Productivity Commission, 2005; OECD Health Database, 2005).

9. The data is based on the EU-AGIR Project; see Westerhout and Pellikaan (2005). The complete expenditure profiles were only available for a subset of OECD countries. A number of different adjustments and estimations were made in order to derive these curves for other OECD countries. Moreover, for some countries only total costs were available and thus health care had to be separated from long-term care. For 12 countries, the data were simply not available. In this case, the expenditure curves were estimated by adjusting expenditures as a spline function of age, based on available data, and were calibrated on the basis of total health expenditures derived from OECD (2005a). These estimation procedures are described in detail in Annex 2A.

14. The shape of the aggregate cost curves can be explained by movements across age groups in health care expenditures for these two segments of the population. Indeed, the upward shape of the average cost curve reflects the fact that mortality rates are higher for older age groups. At the same time, the fact that the cost curves tend to peak and then decline at very old ages can be explained by considerations related to the cost of death. While the probability of dying increases with age, the costs of death tend to decline steadily after young and prime ages (Aprile, 2004). Finally, the little spike in health expenditures at the youngest age is related in part to infant mortality being higher than prime-age mortality.

15. Noteworthy, the death-related costs hypothesis has logical implications for the health status of *survivors*. In the extreme case where health costs are only death-related, there are only two outcomes: an individual either dies or survives in good health. To be consistent over time the projected increase in life expectancy must be accompanied by an equivalent gain in the numbers of years spent in good health. Otherwise, an increasing share of the population living in “bad health” would emerge. Average health care costs would then cease to be mainly driven by the costs of death, as initially assumed.

16. Thus, the death-related costs hypothesis implies that longevity gains are translated into years in good health. Under this “healthy ageing” scenario, the cost curve for *survivors* is allowed to shift rightwards, progressively postponing the age-related increases in expenditure.[10] This development tends to reduce costs compared with a situation in which life expectancy would not increase. Other health status scenarios have been envisaged in previous research (see Box 2) and the projections in this paper test the sensitivity of the results to these alternative assumptions.

17. As regards *non-survivors*, two different demographic effects are at play. On the one hand, the number of deaths is set to rise due to the *transitory* effect of the post-war baby-boom. On the other hand, if mortality falls over time, due to a *permanent* increase in longevity, fewer will be at the very end of life in each given year, mitigating health care costs.[11] The total effect on public health care expenditures will depend on the relative size of these effects.

Box 2. Longevity and health status scenarios

Different health status scenarios have been envisaged in the literature. In an “expansion of morbidity” scenario (Grunenberg, 1977), the share of life spent in bad health would increase as life expectancy increases, while a ”compression of morbidity” scenario (Fries, 1980) would mean the opposite. Currently, equilibrium between longevity and morbidity is observed in many OECD countries. Accordingly, and striking a compromise between the expansion and compression scenarios, Manton (1982) put forward the ”dynamic equilibrium” hypothesis where longevity gains are translated one-to-one into years in good health (hereafter, referred as ”healthy ageing”).

In this context, Michel and Robine (2004) proposed a general approach to explain why countries may shift from an expansion to a contraction of morbidity regime, or achieve a balanced equilibrium between longevity gains and the reduction of morbidity. They identified several factors at work: *i)* an increase in the survival rates of sick persons which would explain the expansion in morbidity; *ii)* a control of the progression of chronic diseases which would explain a subtle equilibrium between the fall in mortality and the increase in disability; *iii)* an improvement in the health status and health behaviour of the new cohorts of old people which would explain the compression of morbidity, and eventually; *iv)* the emergence of very old and frail populations which would explain a new expansion in morbidity. Depending on the relative size of each of these factors, countries could evolve from one morbidity regime to another.

10. In contrast, in a “pure demographic” approach to health care expenditures, the cost curves would not shift rightwards with ageing, reflecting the implicit assumption of unchanged health status at any given age. When the cost curves stay put in presence of longevity gains, the share of life lived in ‘bad health’ increases when life expectancy increases.

11. See for example Fuchs (1984), Zwiefel *et al.* (1999), Jacobzone (2003) and Gray (2004).

Projecting non-demographic drivers of expenditure

18. Income growth is certainly the main non-demographic driver of expenditures, although the vast literature on this topic is still somewhat inconclusive on the precise value of the income elasticity (see Annex 2B). Two insights can, nevertheless, be drawn. *First*, income elasticity tends to increase with the level of aggregation, implying that health care is both "an individual necessity and a national luxury" (Getzen, 2000). *Second*, without reliable price data for health-related goods and services, the high income elasticities (above unity) often found in macro studies may result from the failure to control for true price effects. In this context, the most reasonable approach seems to assume unitary income elasticity and, subsequently, to test the sensitivity of the projections to this assumption.

19. After controlling for demographic and income effects, a residual expenditure growth can be derived. Between 1981 and 2002 (Table 2.1), public health spending grew on average by 3.6% per year for OECD countries,[12] of which 0.3 percentage point was accounted by pure demographic effects[13] and 2.3 percentage points by income effects (assuming unitary income elasticity). Thus, the residual growth can be estimated at around 1% per year. Over an extended sample, 1970-2002, the residual growth would much higher to reach 1.5% per annum (Table 2.2). This difference reflects the implementation of cost-containment policies over part of the 1980s and the 1990s that curbed the strong residual growth of the 1970s (Box 3).

[Table 2.1 Decomposing growth in public health spending, 1981-2002]
[Table 2.2 Decomposing growth in public health spending, 1970-2002]

20. What are the factors underlying this residual expenditure growth? The main culprits seem to be technology and relative prices.[14] Indeed, the gains in health status discussed above do not only arise from improvements in lifestyle (Sheehan, 2002; Cutler, 2001), but also from advances in medical treatment/technology. The latter, however, do not come free of economic cost. Technical progress can be cost-saving and reduce the relative price of health products and services, but its impact on expenditure will depend on the price elasticity of the demand for health care. If it is high, a fall in prices will induce a more than proportionate rise in demand, increasing expenditures.[15] Even if prices do not fall, new technologies may increase demand by increasing the variety and quality of products.[16,17]

12. This estimate was carried out for total health spending given that the split between health care and long-term care expenditures is not available in time series for historical data. Given the low share of public long-term care expenditure to GDP in 2000 (typically below 1% of GDP; OECD, 2005b), this approximation of the residual growth seems reasonable.

13. To simplify calculations, the effect of past ageing does not incorporate "healthy longevity" and "death-related cost" as is done in the projections. In any event, the ageing effect was small and would have even been even smaller if a more sophisticated method had been applied. If anything, *ceteris paribus*, ignoring these past factors is likely to have lead to a downward bias in the estimated residual.

14. See Fuchs (1972) and Mushkin and Landefeld (1979). More recently, there has been a renewal of interest in this approach, see Newhouse (1992), KPMG Consulting (2001), Wanless (2001), Productivity Commission (2005a-b).

15. For example, Dormont and Huber (2005) found that in France the unit price of certain surgical treatments, such as cataract, decreased whereas the frequency of the treatments increased significantly. Such effects can explain much of the recent upward shift in the health care cost curves in France.

16. This is equivalent to say that the "true" relative price of health care *vis-à-vis* all other goods in the economy decreases. Consider for example the case of a demand for variety model with a CES utility function: $U = \sum_i x_i^{(\sigma-1)/\sigma}$, where σ>1 is the elasticity of substitution among products.

21. In projecting public health care expenditures, two alternative scenarios were envisaged for the future: one in which the residual effect of technology and prices continues to rise at the historical rate and another in which this rate declines over time due to cost containment policies. Should the country-specific historical growth rates in the residual be used to project expenditures? There are least two reasons for questioning this choice. First, in countries where cost-containment policies have resulted in a low or negative residual (*e.g.,* Austria, Denmark, Ireland, Italy, Sweden) there could be a trend reversal, e.g. because new personnel has to be attracted or run-down facilities renewed. Second, in countries where the residual growth was very high (*e.g.,* Portugal, Turkey, United States) it may seem likely that cost-containment policies will be implemented in the future. These effects would lead to a certain cross-country convergence of the expenditure residual over time. Therefore, in most of the projection scenarios, an OECD *average* residual was preferred to project expenditures.

Box 3. Cost-containment policies in OECD countries: an overview[1]

Faced with unsustainable growth in health care spending over the 1960s and 1970s, governments initially aimed at containing it through various kinds of macroeconomic restrictions. These policies often created allocative problems of their own. Wage and price controls had negative consequences on the supply of health while top-down spending constraints also discouraged providers to increase output or to enhance productivity.

More recently the focus turned to more efficient provision of care. Nonetheless, while spending growth has slowed considerably over the past two decades, studies using statistical tests of the impact of budgetary caps or other policies to limit spending provide little evidence of a strong impact. In some cases, the reduction of health care costs has been achieved by transferring spending to other areas, such as long-term care. Supporting this view is the fact that countries that have been most effective at controlling health care spending are also the ones where long-term care expenditures have increased most rapidly.

Macroeconomic cost-containment initiatives

Wage controls have been used in public integrated systems in both the hospital and the ambulatory sector where health care personnel are paid on a salary basis (Denmark (hospitals), Finland, Ireland (hospitals), Spain, Sweden and the United Kingdom (hospitals)). Such policies were part of a broader public sector restraint rather than specific to the health sector.

Price controls have been widely used, particularly in areas where governments set prices administratively or have oversight on prices agreed between health care purchasers and providers. A number of countries have set fees directly (*e.g.,* Australia, Belgium, France, Japan, Luxembourg and Canada). In others, prices have been automatically adjusted to offset volume overrun so as not to exceed a fixed budget ceiling (*e.g.,* Germany (ambulatory care), Austria (hospital care), Hungary (outpatient care), and recent Belgium reforms). Administrative price setting has probably been most widespread for pharmaceutical drugs.

Limits in most countries on entry to medical schools are an important factor affecting the growth of the number of medical professionals. The number of new doctors per capita has slowed as a result. There have also been reductions in support staff (Canada, Sweden). Policies to restrain supply have actually led to supply shortages in, for example, Canada, the United Kingdom and Denmark and waiting lists are a common feature across OECD countries. In countries like Finland, France and Korea an upward pressure on wages has unfolded.

Hospital supply policies have encouraged a reduction in the number of beds per capita and concentrated acute care in larger hospital units so as to achieve economies of scale and scope. Nonetheless, the level of acute-care beds per capita remains relatively high in some countries (such as Austria, the Czech Republic, Germany, Hungary and the Slovak Republic).

Budgetary caps or controls have been a widely used instrument for controlling expenditure. In general, policies to control and reshape supply and to cap spending in the hospital sector appear to have been more successful than for ambulatory care or pharmaceutical drugs. Spending control through budgetary caps also appears to have been most successful in countries such as Denmark, Ireland, New Zealand and the United Kingdom where integrated models of health-care financing and supply are (or were)

To simplify, let us assume price symmetry ($p_i = p, \forall i$). The true composite price index is then equal to $P^* = n^{(1-\sigma)} \cdot p$. With two types of composite goods, say health (*H*) and all other goods (*O*), the true relative price would be: $P_H^*/P_O^* = (n_H/n_O)^{(1-\sigma)} \cdot (p_H/p_O)$. Thus, even if the usual price ratio (p_H / p_O) remains constant, the "true" relative price P_H^* / P_O^* would decrease when the pace of product creation in the health sector is much faster than in the rest of the economy.

17. Some governments are attempting to introduce such quality adjustments in the measure of output (and hence prices) of public services. See Grice (2005) for a discussion on this point based on the Atkinson Review, prepared for the UK Office for National Statistics.

the rule and in mainly single-payer countries, such as Canada, where health-care budgets are generally explicitly set through the budget process.

Cost sharing has been an increasingly common feature over the 1980s and, particularly, the 1990s. Greater cost-sharing has mainly affected pharmaceuticals, while patient payments for inpatient and doctors visits have been less widespread (Sweden, Italy, France). This is presumably connected to the higher price elasticity for pharmaceutical drugs than for ambulatory and, particularly, for hospital care.

Improving cost-efficiency at the micro level

Ambulatory care is of key importance to the overall efficiency and effectiveness of health-care systems; it usually is the place where contact between patient and health care personnel is first established and ambulatory care is generally less expensive than hospital care. The gate-keeping role of general practitioners (GPs) has been encouraged in some countries (United Kingdom, New Zealand, Norway, United States and France). In Eastern European countries, the ambulatory sector has been shifted from the public sector to private practitioners in the course of the 1990s and, in some cases, they are now paid on a capitation basis.

Hospital sector reforms concern first and foremost the separation of purchasers and providers within public integrated systems. Purchasers/funders of health care are responsible to the budgetary authorities for cost control and to patients for the quality and accessibility of care. A significant number of countries with integrated systems have now moved in this direction (Australia, United Kingdom, New Zealand, Sweden, Italy, Portugal and, more recently, Greece). More active purchasing has also occurred in countries with public contract models (Germany, Belgium). The role of purchasers has been enhanced in the United States. The contracting out of selected activities has increased, where these can be provided more cheaply externally. Finally, a limited number of countries (the United States, the United Kingdom, Sweden, the Czech Republic and New Zealand) have experimented with greater competition among hospitals as a means of inducing improvement in efficiency, quality, and responsiveness.

1. This Box is based on and draws extensively on Docteur and Oxley (2003).

Combining demographic and non-demographic drivers

22. To sum up, defining *HE*, *Y* and *N* as real health care expenditures, real income and population, respectively; and, ε the income elasticity of health expenditures, the growth of health expenditures can be decomposed as follows:

$$\Delta \log\left(\frac{HE}{N}\right) = \Delta \log(adjusted\ \ age\ factor) + \varepsilon \cdot \Delta \log\left(\frac{Y}{N}\right) + \Delta \log(residual) \qquad (1)$$

or expressed in share of expenditure to GDP:

$$\Delta \log\left(\frac{HE}{Y}\right) = \Delta \log(adjusted\ age\ factor) + (\varepsilon - 1) \cdot \Delta \log\left(\frac{Y}{N}\right) + \Delta \log(residual) \qquad (2)$$

23. The mechanical effect of population ageing on expenditures can be interpreted as first moving up along the cost curve, assuming that the age profile of expenditures remain constant over time (Figure 2.3, Panel 1). This age factor is then adjusted by incorporating the healthy longevity hypothesis, corresponding to a rightward shift of the cost curve (Figure 2.3, Panel 2).[18] As mentioned above, this shift implies that older people still cost more than the young, but at progressively older ages. Finally, the cost curve may shift upwards (Figure 2.3, Panel 3) due to non-demographic drivers (income and the residual).

[Figure 2.3 Shifts in expenditure profiles, ageing and non-ageing effects]

18. See Annex 2A for more details.

24. Once the total logarithmic growth rates are estimated for each country, the projection framework computes the changes in expenditure shares to GDP considering a common starting point. The latter is computed as the cross-country average share of public health care spending in GDP in 2005, thus can be viewed as a sort of OECD representative country. The changes in expenditure calculated from this common base are then added to the country-specific initial shares to obtain future projected ratios of expenditure to GDP. This method has two advantages. Over the long run, it makes the projections more comparable across countries, as the effects of the different mechanisms at work during the projection period are isolated from the impact of the initial conditions.[19] Moreover, it allows a certain catch-up across countries in the ratios of public health care expenditures to GDP.

25. Additional exogenous assumptions underlying the projections for both health and long term care are listed in Box 4 (more details are also provided in Annex 2B).

Box 4. Exogenous variables and assumptions underlying the projections

The projections require a set of exogenous data, as follows:

(1) Population projections (*N*). The population projections were gathered by the OECD Directorate on Employment, Labour and Social Affairs, directly from national sources. Given that the underlying assumptions on fertility and life expectancy are not necessarily uniform across countries (see Oliveira Martins *et al.*, 2005 for a discussion), this paper also uses a population maquette (Gonand, 2005) to test the sensitivity of the results to uniform longevity assumptions for a selected group of countries.

(2) Labour force projections (*L/N*) rely on previous OECD work (Burniaux *et al.*, 2003). These projections are constructed in the basis of a, so-called, cohort approach. They correspond to a baseline scenario, i.e. the impact of current policies is assumed to influence labour participation over the next decades, but no additional assumptions are made concerning future policy changes.

(3) Labour productivity (*Y/L*) growth is assumed to converge linearly from the initial rate (1995-2003) to 1.75% per year by 2030 in all countries, except former transition countries and Mexico where it converges only by 2050.

Summary statistics on the exogenous assumptions are provided in Annex 2A. The projected GDP per capita is directly derived from the above exogenous variables ($Y/N = Y/L \times L/N$). This simple framework is not supposed to capture in the best way productivity differentials across countries, but to isolate, as far as possible, the effect of ageing and other demographic factors on the projections.

Alternative scenarios for OECD countries

26. The framework described above was used to project expenditures over the period 2005-50. In the main scenarios, the income elasticity is set to one, thus income effects are not creating additional pressures in terms of expenditure shares to GDP. The main assumptions underlying each projection scenario are listed in Table 2.3.

[Table 2.3 Assumptions underlying the alternative projection scenarios: Health care]

Demographic effects

27. As discussed above, demographic effects on public health care expenditures can be decomposed into the health care costs for survivors, the adjustment for "healthy ageing" and the death-related costs, as shown in Panel A of Figure 2.4. The pure ageing effect can be quite large in some countries, but it tends to

19. Without this specification, spending patterns of countries with equivalent expenditure drivers would diverge in terms of share of expenditure to GDP merely due to different initial expenditure to GDP ratios.

be compensated by a better health status. The death-related costs account only for a small fraction of the increase in expenditures as a share of GDP. In level terms, they increase from around 5% of total health care spending in 2005 to 7% by 2050.

[Figure 2.4 Demographic effects on health care expenditure]

28. The total effect of demographics on health care expenditures displays a wide cross-country dispersion. It ranges from virtually zero in Sweden to 1.6 percentage points of GDP for Korea. This can be related to differences in evolving population structures, as displayed by the changes in old-age dependency ratios (Panel B of Figure 2.4).

29. However, on average, the demographic effect only accounts for a small increase in expenditure, from 5.7% in 2005 to 6.3% by 2050, or 0.6 percentage points of GDP (Table 2.4). Admittedly, the "healthy ageing" assumption may render the simulation of demographic effects relatively optimistic, but this is in line with observed patterns of health status regimes in many OECD countries. For some countries, such as Australia, the healthy ageing hypothesis may seem less plausible in view of past trends and, therefore, the sensitivity of the results to this assumption was tested below.

[Table 2.4 Projection scenarios for public health care expenditure]

A cost pressure scenario

30. In this scenario it is assumed that, on top of the demographic effects and income effects, the expenditure residual continues to grow at 1% per year over the projection period. This induces a substantial increase in the health expenditures, averaging nearly 4 percentage points of GDP from 2005-2050. In most countries, health care expenditures would then approach or exceed 10% of GDP by the end of the projection period.

31. While these figures may be useful as a benchmark, they do not seem very plausible. It is unlikely that public health care expenditures to GDP could continue to grow at such constant rate, without limit. A long-run convergence (or transversality) condition is therefore considered in the next scenario.

A cost-containment scenario

32. In the "cost-containment" scenario it is assumed that residual expenditure growth converges to zero by 2050,[20] implicitly meaning that policies are effective in controlling expenditure growth driven by some of the non-demographic factors. These policies have been already enacted in the past (see Box 3 above) and could progressively rein in the expenditure residual, for example by ensuring that future technology improvements are mainly used in a cost-saving way. In the absence of additional ageing effects, this would imply that public health care expenditure and income would evolve in parallel over the very long-run.[21]

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20. This is roughly equivalent to assuming that the residual grows at a constant rate of ½ per cent per year.

21. This convergence assumption (or transversality condition) may appear controversial in view of past experience. The assumption is justified by the fact that the expenditure growth has to be financed by the public purse. Under perfect health market conditions, a continuing increase in the share of income going to health care spending could reflect individual preferences. But the health care market is not perfect and governments are footing most of the bill. Thus, rapid growth of the share of health care spending in income would have to be compensated by reductions in other public spending items, which may be difficult to achieve, and/or increased health care charges for individuals. Such cost sharing has already been introduced in most countries. Similar transversality conditions have also been imposed in other projection

33. Under this rather optimistic scenario, public health care expenditures in the OECD area would still increase on average by two percentage points between 2005 and 2050, from 5.6% to 7.7% of GDP (Table 2.4). Large increases (above 2.5 percentage points of GDP) by 2050 are found (in descending order) in Korea, Slovak Republic, Mexico and Japan. Most of these countries are experiencing a rapid demographic change induced by the sharp fall in fertility rates.

Sensitivity analysis

34. In the sensitivity analysis, a number of parameters were changed compared with the "cost-containment scenario": the size of the income elasticity, the magnitude of the residual, as well as factors underlying health status scenarios and demographic projections. Overall, the previous results seem relatively robust, as these alternative simulations do not change qualitatively the picture emerging from the comparison of the "cost-pressure" and "cost-containment" scenarios discussed above.

Residuals, income elasticity and different health scenarios

35. Unsurprisingly, applying country-specific growth rates of the residual component[22] would significantly affect spending patterns of individual OECD countries (Table 2.4). Korea, Mexico, Portugal, Switzerland, the United States would record significant increases (above two percentage points of GDP) compared with the "cost-containment" scenario.[23] If anything, this scenario illustrates the unsustainability of current health expenditure trends in some OECD countries. In contrast, in countries where recent cost-containment policies were successful, the projected expenditure shares would tend to be more moderate than in the cost-containment scenario (*e.g.,* Denmark, Sweden). Other countries would display large decreases in expenditures because the effect of past residual growth resulting from idiosyncratic conditions, such as the scaling back of former welfare systems during economic transition (Czech Republic, Hungary, Poland and Slovak Republic), would be prolonged in the future.

36. To assess sensitivity to income elasticity, projections were run with elasticities below and above unity (0.8 and 1.2, respectively), while keeping the residual as in the cost-containment scenario.[24] Under these alternative scenarios, average OECD public health care expenditure shares would range from around 7% to 8.7% of GDP. The countries with the largest projected GDP per capita growth (*e.g.* Ireland, Mexico, Poland, see Table A2.1 in Annex 2A) are obviously the most affected by changes in income elasticity.

37. As discussed above, the residual was derived from trends observed over the two past decades, a period characterised by efforts to contain costs. Assuming that the residual would grow at 1.5% per year (as observed on average over the past three decades), but that it would still decline to zero over the projection period, would induce an average increase of less than one percentage point of GDP compared with the cost-containment scenario.

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exercises. For example, Englert (2004) assumes that income elasticity ultimately converges to one. For symmetry, negative residuals are assumed to increase towards zero over the projection period, in the scenario with country-specific residuals.

22. Note that the residual is still assumed to converge towards zero over the projection period.

23. Given the very high historical growth rate of the residual for Turkey, this country was excluded from this simulation as it produced rather implausible shares of health care expenditures to GDP by 2050.

24. Note that when the chosen income elasticity is assumed to be changed both in the past and in the future, applying sub-unity elasticity would increase the residual when explaining past data. This means, when projecting, that the drag on expenditure growth from lower income elasticity would be offset by a higher residual, and vice versa. By construction, such scenarios would not produce very different results.

38. Sensitivity to alternative health regimes was also explored. In a "compression of morbidity" scenario the shift in the cost curves is twice the adjustment applied in the "healthy ageing" regime. Alternatively, a regime of "expansion of morbidity" corresponds to a scenario where longevity gains are not translated into "healthy ageing". Under these scenarios, average health expenditures by 2050 range from 7 to 8.5% of GDP. This shows that alternative health regimes matter for projecting future expenditure trends, but their impact is smaller than non-demographic effects.

Alternative population projections

39. As noted in Box 4, national population projections are not based on harmonised assumptions across countries. In particular, projected longevity gains can differ widely and, on average, are also lower than observed in the past decades. Accordingly, an alternative scenario was tested where longevity is assumed to increase uniformly across countries by two years per decade, in line with past trends. These alternative population projections were derived from a stylised demographic *maquette*, mimicking national projections (see Gonand, 2005).

40. The simulations were carried out for five large OECD countries (France, Germany, Italy, Japan and United States). Taking again the 'cost-containment' scenario as a benchmark, the implied deviations are relatively modest (on average an increase in expenditures below ½ percentage point of GDP, see Table 2.5). This could be expected in a world of "healthy ageing". Indeed, a framework were demographic effects are not adjusted to healthy ageing would be much more sensitive to underlying idiosyncrasies in national population projections. Nonetheless, the joint effect of an "expansion of morbidity" assumption and higher longevity gains would generate a sharp increase in expenditures, of around 1½ percentage points, compared with the "cost-containment" scenario. This stresses the important fact that it is not longevity or health status *per se* that could induce expenditure pressures, but rather their interaction.

[Table 2.5 Sensitivity analysis of health care expenditure to population projections]

3. Long-term care

41. Long-term care (hereafter, LTC) differs from health care. While health care services aim at changing a health condition (from unwell to well), long-term care merely aims at making the current condition (unwell) more bearable. Individuals need LTC due to disability, chronic condition, trauma, or illness, which limit their ability to carry out basic self care or personal tasks that must be performed every day. Such activities are defined as activities of daily living, ADLs (eating, dressing, bathing, getting in and out of bed, toileting and continence) or instrumental activities of daily living, IADLs (preparing own meals, cleaning, laundry, taking medication, getting to places beyond walking distance, shopping, managing money affairs and using the telephone/Internet). A person is dependent if he or she has limitations in ADLs and IADLs.

42. At around 1-2% of GDP, the importance of current public long-term care spending is limited compared with health care. Still, as LTC spending is heavily concentrated among the elderly (Wittenberg *et al.*, 2002), the projected demographic change suggests that its share in the economy is likely to increase. As for health care, the expenditure profiles constitute the foundation of the projection framework. In contrast with health care, the cost curves for LTC are basically close to zero up to age 60-65, and then increase sharply and monotonically, with different slopes across countries (Figure 3.1). These

characteristics stem from different features, such as the mix between (expensive) formal and (inexpensive) informal care and the current prevalence of dependency (disability status).[25]

[Figure 3.1 Public long-term care expenditure by age group]

Projecting demographic drivers of expenditure

43. Whereas health care projections distinguished between survivors and non-survivors, the LTC projections split each age group into *dependants* and *non-dependants*.[26] Deriving the cost of LTC *per dependant* requires an estimate of the prevalence of dependency by age group. Unfortunately, one of the most comprehensive study in this area (Comas-Herrera *et al.*, 2003) provides dependency figures only for Germany, Italy, Spain, and the United Kingdom. Nonetheless, it can be observed that the shape of the dependency ratios by age is similar in these four countries (Figure 3.2). This suggests that, as a first approximation, dependency ratios could be assumed to be broadly uniform across countries. For the purpose of projecting expenditure, this has also the advantage of eliminating current differences in prevalence of dependency across age groups as a possible cause for future different increases in LTC expenditures. Put differently, the projections become less sensitive to initial conditions. Along these lines, the original expenditure profiles were divided by the average cross-country dependency ratio in order to derive the LTC expenditures per dependant person (Figure 3.3).

[Figure 3.2 Prevalence of dependency per age group]
[Figure 3.3 Adjusted long-term care expenditure per dependant]

44. There is a great deal of uncertainty about the extent to which disability has changed over time or could change for future generations (see Box 5). Internationally-comparable data in this area is also limited (Lagergren and Batljan, 2000; Jacobzone *et al.,* 2000; Wittenberg *et al.,* 2001). Moreover, disability is not necessarily translated into dependency, as the technical progress could help a disable person to work and take part in everyday life. Despite hard evidence on these phenomena, this paper assumes that the prevalence of dependency improves as life expectancy increases. However, while for health care "healthy ageing" implied that every year gained in longevity is one in good health, the assumption for dependency is not as sanguine. One could argue that for the oldest old, where dependency is most prevalent, the potential for experiencing complete healthy longevity gains is decreasing. Accordingly, the "healthy ageing" hypothesis for long-term care was (arbitrarily) assumed to be that only *half* of the longevity gains are translated into a reduction in dependency. Alternative scenarios allow testing the sensitivity of the results to this assumption.

25. For comprehensive discussions of long-term care, see for example OECD (2005b), Lundsgaard (2005), Karlsson *et al.,* (2004), Comas-Herrera *et al.* (2003), Norton (2000) and Wittenberg *et al.* (1998). Interesting UK case studies are Davies *et al.,* (1990) and Evandrou *et a,.* (1998). As an indication of the potential spending pressures, the average cost per year of institutional long-term care for old persons in France is currently at 35,000 € per dependant, and in the range of 40,000-75,000 US$ per dependant for the United States (Taleyson, 2003).

26. Indeed, even if the unit costs of long-term care per dependant are equal in, say, countries A and B, the cost curves by age group would still differ if the share of dependants in each age group is different in each country.

Box 5. Has disability fallen over time?

Answering this question is not easy because consistent cross-country data on disability rates simply do not exist. Disability is usually measured through the inability of performing one or more Activities of Daily Living (ADL). Evidence for some OECD countries suggests that the share of the severely disabled has fallen over time, while no conclusion could be reached concerning the evolution of moderate disability. Studies on the United States, for which more data are available, show that disability rates may have declined somewhat among the oldest but have increased among younger age groups, a phenomenon that is often linked to obesity trends (cf. Rand Research Bulletin, 2004).

Nonetheless, downward trends in disability may not be accompanied by a lower pressure on expenditures. On the contrary, increased spending on health care is rather the precondition for lower disability (Lichtenberg and Virabhak, 2002; Lichtenberg, 2003; Jacobzone, 2003). Indeed, helping a chronically-ill person to be autonomous may require access to the high-cost technical frontier in bio-tech/drugs.

Projecting non-demographic drivers of expenditure

45. The main non-demographic driver of LTC expenditure is related to the relative shares of *informal*[27] and *formal* care and their evolution over time.[28] While the bulk of LTC is provided informally throughout the OECD area, it is relatively more important in southern European or lower income countries. As labour force participation is projected to increase in the future, concerns are expressed that informal care will have to be substituted by more expensive formal care, adding to the fiscal burden alongside the projected greying of the population (OECD, 2005b; Comas-Herrera *et al.,* 2005).[29]

46. Wage trends among staff providing LTC would also be a significant driver of costs. Data from a UK study shows that staff costs in public sector homes accounted for 85% of total unit costs (Netten *et al.,* 1998). Similarly, a study in Germany found that staff costs accounted for between 70% and 90% of total unit cost of nursing homes (Reinhold, 2001).

47. LTC is highly labour intensive, but the room for productivity gains is probably limited. Therefore, it could be exposed to a "cost disease" or Baumol (1967, 1993)'s effect. In short, this implies

27. Most informal care is provided by partners or children. To be considered informal, the provision of care cannot be paid for as if purchasing a service. However, an informal care giver may receive income transfers conditioned on his/her provision of informal care and possibly, in practice, some informal payment from the person receiving care. On the other hand, formal care is provided by care assistants who are paid for providing care under some form of employment contract. It includes care provided in institutions as well as care provided at home. The difference between formal and informal care is first of all not about the type of care, but who provides it (Lundsgaard, 2005).

28. Due to lack of sufficiently comparable information across countries, this paper does not incorporate another important distinction, which is the subdivision of formal care into institutional care and care delivered to the patient's home. There are indeed fundamental differences between countries in the way they organise their formal LTC. Institutional LTC is particularly widespread in the Nordic countries. Norway and Sweden stand out with substantially higher LTC spending than any other country due to generous services (single rooms and well-equipped housing infrastructure) provided for residents in nursing homes (OECD, 2005b). Whether this organisation is adopted by other countries or a (cheaper) ambulatory help-at-home strategy is pursued could have important consequences for public expenditures.

29. There are indications that the proportion of older people living alone increased up to the early 1990s, although trends appear to have changed since (Tomassini *et al.*, 2004 and Borsch-Suppan, 2005).

that relative prices of LTC *vis-à-vis* other goods and services in the economy tend to rise, reflecting the negative productivity differential and equalisation of wages across sectors. With a price-inelastic demand, the share of LTC expenditure in GDP would tend to increase over time. A possible way to capture this effect is to assume that unit costs rise in line with average earnings of care staff or a measure of wage inflation in the economy (Comas-Herrera *et al.,* 2003).

48. It is plausible that income growth could push up LTC expenditure, although empirical evidence on the income elasticity of LTC expenditure is just not available. Considering that LTC can be characterised as a necessity, the income elasticity could be probably small or close to zero, though it could be expected that with the development of long-term care services a demand for higher quality services could also develop.

49. In order to assess the impact of these different drivers on the observed differences of LTC costs per dependant across countries, a simple econometric model was specified:[30]

$$Log\left(\frac{LTC}{ND}\right) = \alpha + \beta_1 \cdot Age + \beta_2 \cdot Z + \beta_3 \cdot W + u \qquad (3)$$

where *LTC* is total long-term care expenditure, *ND*, the number of dependants, *Age* is the central point in each age bracket (2, 7, 12,…, 97), *Z* a proxy capturing the provision of informal care and *W* a proxy for the other effects (relative prices and/or income). The model was estimated using a panel of eleven EU countries by twenty age groups. Following several alternative specification tests (not reported here), the availability of informal care appeared to be best proxied by the participation ratio of the population aged 50-64. The level of GDP per capita was included but it did not appear significant, suggesting that the income elasticity could indeed be small. Given the reduced size of the country cross-section and collinearity problems, it was not possible to test for relative price effects. The equation was first estimated with country-fixed effects (Table 3.1). In the final specification, the fixed-effects were replaced by the participation ratio of people aged 50-64. The estimates of the age and old-age participation coefficients are robust across different specifications and display the expected sign.

[Table 3.1 Econometric estimates of long-term care costs per dependant]

Combining demographic and non-demographic drivers

50. Combining the different drivers, the logarithmic growth of long-term care expenditures to GDP can be decomposed as follows:

$$\Delta\log\left(\frac{LTC}{Y}\right) = \Delta\log(adjusted\ age\ factor) + (\varphi - 1)\cdot\Delta\log\left(\frac{Y}{N}\right) + \gamma\cdot\Delta\log\big(Baumol\ effect\big) + \Delta\log\big(effect\ \ of\ \ participation\big) \qquad (4)$$

where *Y* and *N* are income and population, as defined previously; φ is the income elasticity of LTC expenditures and γ the elasticity characterising the "Baumol effect", i.e. the extent to which an increase of average labour productivity in the economy (a proxy for wage growth) is translated into an increase of LTC costs per dependant.

30. Given that the shape of the expenditure curves by age is close to an exponential function, a log-level specification was used.

51. Using this framework, the drivers are allowed to operate in several ways (see Annex 2A for further details). On demographics, it was assumed that *half* of the projected longevity gains translated into years with lower dependency. This is accomplished by shifting the dependency curve rightwards accordingly.[31]

52. On non-demographics, the cost curve per dependant is assumed to shift upwards due to the increase of the average labour productivity in the economy, thus embodying an implicit “cost-disease”. In most scenarios, the elasticity of this "Baumol effect" (γ) was assumed to be 0.5, probably a mild view on the extent to which the productivity of LTC services could under-perform relatively to the rest of the economy. The income elasticity was assumed in general to be zero, implying that income growth tends to drive down LTC expenditures as a share of GDP. This set of assumptions could be viewed as a relatively optimistic.

53. The second non-demographic effect is related to the participation rate of people aged 50-64, proxying the supply of informal care. Using the econometric model (3), increasing labour market participation trends induce an additional upward shift in the LTC cost curve. The baseline projections on participation rates were derived from Burniaux *et al.*(2003). These projections rely on a cohort-based approach; however, the last cohort used to project participation is the one entering the labour market in year 2000. The behaviour of subsequent cohorts remains unchanged thereafter. The latter could lead to a somewhat subdued projection of future increases in participation rates, especially in countries where these rates were well below average for cohorts entering the labour market in year 2000.

Alternative scenarios for OECD countries

54. The framework described above was used to project expenditures over the period 2005-50, under a range of scenarios similar to the approach followed for the health care projections. The main assumptions underlying each scenario are listed in Table 3.2.

[Table 3.2 Assumptions underlying the alternative projection scenarios: Long-term care]

Demographic effects

55. The first simulation corresponds to demographic effects (Table 3.3). On average, LTC expenditures reach 2.3% of GDP by 2050 or an increase of 1.2 percentage points of GDP compared with 2005. Due to the sharp increase in dependency ratios with age, demographic effects contribute to a relatively much larger increase in LTC expenditures than the one observed for health care. Very large impacts of demographics on LTC expenditures (with increases from 2 to above 4 percentage points of GDP) are found in fast-ageing countries, such as Korea, Slovak Republic, Poland, Czech Republic, Poland, Turkey and Japan. As it can be seen from the detailed projection results provided in Annex 2A (Tables A2.4), the income and the Baumol effects tend to compensate for each other, their joint impact being on average neutral in terms of expenditure shares to GDP.

[Table 3.3 Projection scenarios for public long-term care expenditure]

31. Note that this method differs somewhat from what was presented earlier for health care expenditures, where the cost profile for survivors was shifted directly in line with projected longevity gains. Here the cost profile is shifted indirectly through the shift in dependency rates.

A cost-pressure scenario

56. This scenario assumes a 'full Baumol' effect, implying that LTC costs per dependant increase in line with overall labour productivity. Due to the steady increase in relative prices, LTC expenditures would reach 3.3% of GDP by 2050, or an increase of 2.2 percentage points of GDP compared to 2005.

A cost-containment scenario

57. In this case it is assumed that policies are able to 'contain' the cost pressures associated with the Baumol effect. It is difficult to give a clear interpretation for this policy lever, but in practical terms it means that governments would deploy a continuous effort to generate productivity gains and/or contain upward pressures on wages of staff providing long-term care. In this scenario, the supply of informal care would also continue to be relatively abundant because mild increases in the participation ratios are combined with an increase of the population in the group of 50-64 years old due to the ageing trends. Despite these optimistic assumptions, average LTC expenditures would still more than double from the current base to reach 2.4% of GDP by 2050. Much larger effects are found in countries, such as Greece, Italy, Ireland and Spain where the participation ratios of those aged 50-64 are projected to increase significantly or in countries facing strong demographic pressures, as noted previously.

Sensitivity analysis

58. Given the data uncertainties, sensitivity analysis is particularly important concerning LTC projections. A first scenario captures the possibility of higher income effects. Arbitrarily, it was assumed that the income elasticity is unitary. This would add around ½ percentage points of expenditure to GDP by 2050 compared to the cost-containment scenario.

59. As noted above, future developments in the prevalence of dependency are hard to predict. A "compression of disability" scenario was tested, where the dependency curve is shifted to the right twice as fast as longevity gains. This would reduce LTC expenditures by around ½ percentage point of GDP for the OECD group compared with "cost-containment" scenario. In an "expansion of disability" scenario, the dependency rates remain constant as life expectancy increases and the effect would be symmetrically opposite.

60. Another alternative scenario captures a possible autonomous increase in the dependency rate by 0.5% per year. This could be interpreted as a conservative estimate of the impact of the worrying obesity trends on dependency.[32] On average LTC expenditures would reach 3.5% of GDP by 2050, or a significant shift of more than 1 percentage point of GDP compared to the cost-containment case.

61. In an 'increased participation' scenario, the availability of informal care is dramatically reduced by assuming that all countries converge towards an old-age participation ratio of at least 70% by 2050 (countries having already a participation ratio above that level were supposed to follow their country-specific pattern). This is well above the baseline labour participation projections and would lead to average LTC costs roughly at 4% of GDP by 2050, or an additional expenditure of 1.5 percentage points of GDP compared to the cost-containment scenario. The most significant increases would occur in countries where old-age participation ratios are currently particularly low (*e.g.,* Austria, France, Italy, Turkey and former transition countries).

32. Sturm *et al.* (2004) argue that if current trends in obesity continue, disability rates will increase by 1% a year more in the 50-59 age group than if there were no further weight gains. See also Olshansky *et al.* (2005) for a discussion on the effect of obesity trends on life expectancy.

62. The comparison between this scenario and the cost-containment one gives a sense of the trade-offs involved with policies aiming at increasing participation rates, on the one hand, and the objective of containing future LTC expenditures, on the other hand. In this context, competing demands on the age group 50-64 could be particularly strong.

63. Finally, the sensitivity to alternative population projections was also tested for five OECD countries (France, Germany, Italy, Japan and the United States). Under the "healthy ageing" assumption (i.e. the dependency curves are shifted by half of the increase in life expectancy), higher longevity gains (two years per decade) *per se* do not have a strong impact on expenditures. Average expenditure for the five OECD countries is projected to be around 2.8% of GDP by 2050. In contrast, a scenario where higher longevity gains are coupled with an "expansion of disability" would push average LTC expenditures to above 4% of GDP by 2050.

[Table 3.4 Sensitivity analysis of long-term care expenditure to population projections]

64. To sum-up, the sensitivity analysis showed that the long-term care projections presented here seem relatively robust to alternative specifications of the income elasticity, health status and longevity assumptions. In contrast, increased dependency associated with obesity trends or lower provision of informal care could have a much stronger impact on expenditures. A combination of these negative factors would obviously generate a rather gloomy perspective for public budgets.

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ANNEX 1. LIST OF TABLES AND FIGURES

Tables

Figures

Table 1.1 **Public health and long-term care spending**

In % of GDP

	Health care			Long term care			Total		
	2005	2050		2005	2050		2005	2050	
		Cost-pressure	Cost-containment		Cost-pressure	Cost-containment		Cost-pressure	Cost-containment
Australia	5.6	9.7	7.9	0.9	2.9	2.0	6.5	12.6	9.9
Austria	3.8	7.6	5.7	1.3	3.3	2.5	5.1	10.9	8.2
Belgium	5.7	9.0	7.2	1.5	3.4	2.6	7.2	12.4	9.8
Canada	6.2	10.2	8.4	1.2	3.2	2.4	7.3	13.5	10.8
Czech Republic	7.0	11.2	9.4	0.4	2.0	1.3	7.4	13.2	10.7
Denmark	5.3	8.8	7.0	2.6	4.1	3.3	7.9	12.9	10.3
Finland	3.4	7.0	5.2	2.9	5.2	4.2	6.2	12.2	9.3
France	7.0	10.6	8.7	1.1	2.8	2.0	8.1	13.4	10.8
Germany	7.8	11.4	9.6	1.0	2.9	2.2	8.8	14.3	11.8
Greece	4.9	8.7	6.9	0.2	2.8	2.0	5.0	11.6	8.9
Hungary	6.7	10.3	8.5	0.3	2.4	1.0	7.0	12.6	9.5
Iceland	6.8	10.7	8.9	2.9	4.4	3.4	9.6	15.2	12.3
Ireland	5.9	10.0	8.2	0.7	4.6	3.2	6.7	14.5	11.3
Italy	6.0	9.7	7.9	0.6	3.5	2.8	6.6	13.2	10.7
Japan	6.0	10.3	8.5	0.9	3.1	2.4	6.9	13.4	10.9
Korea	3.0	7.8	6.0	0.3	4.1	3.1	3.3	11.9	9.1
Luxembourg	6.1	9.9	8.0	0.7	3.8	2.6	6.8	13.7	10.6
Mexico	3.0	7.5	5.7	0.1	4.2	3.0	3.1	11.7	8.7
Netherlands	5.1	8.9	7.0	1.7	3.7	2.9	6.8	12.5	9.9
New Zealand	6.0	10.1	8.3	0.5	2.4	1.7	6.4	12.6	10.0
Norway	7.3	10.7	8.9	2.6	4.3	3.5	9.9	15.0	12.4
Poland	4.4	8.5	6.7	0.5	3.7	1.8	4.9	12.2	8.5
Portugal	6.7	10.9	9.1	0.2	2.2	1.3	6.9	13.1	10.4
Slovak Republic	5.1	9.7	7.9	0.3	2.6	1.5	5.4	12.3	9.4
Spain	5.5	9.6	7.8	0.2	2.6	1.9	5.6	12.1	9.6
Sweden	5.3	8.5	6.7	3.3	4.3	3.4	8.6	12.9	10.1
Switzerland	6.2	9.6	7.8	1.2	2.6	1.9	7.4	12.3	9.7
Turkey	5.9	9.9	8.1	0.1	1.8	0.8	6.0	11.7	8.9
United Kingdom	6.1	9.7	7.9	1.1	3.0	2.1	7.2	12.7	10.0
United States	6.3	9.7	7.9	0.9	2.7	1.8	7.2	12.4	9.7
Average	***5.7***	***9.6***	***7.7***	***1.1***	***3.3***	***2.4***	***6.7***	***12.8***	***10.1***

Source : Secretariat calculations.

Table 2.1 **Decomposing growth in public health spending [1], 1981-2002 [2]**

	Health spending	Age effect	Income effect [3]	Residual
Australia (1981-2001)	3.6	0.4	1.8	1.4
Austria	2.2	0.1	2.1	0.0
Belgium (1995-2002)	2.9	0.4	1.7	0.6
Canada	2.6	0.4	1.7	0.6
Czech Republic (1993-2002)	2.7	0.4	2.8	-0.4
Denmark	1.3	0.1	1.7	-0.5
Finland	2.6	0.3	2.1	0.2
France	2.8	0.2	1.6	1.0
Germany	2.2	0.2	1.2	1.0
Greece (1987-2002)	3.4	0.4	1.3	0.8
Hungary (1991-2002)	1.5	0.3	2.8	-1.5
Iceland	3.5	0.1	1.5	1.9
Ireland	3.9	0.1	4.9	-1.0
Italy (1988-2002)	2.1	0.7	1.7	-0.1
Japan (1981-2001)	3.8	0.4	2.2	1.1
Korea (1982-2002)	10.1	1.4	6.1	2.4
Luxembourg (1981-2002)	3.8	0.0	3.9	-0.1
Mexico (1990-2002)	4.5	0.7	0.5	2.4
Netherlands (1981-2002)	2.6	0.3	1.9	0.3
New Zealand	2.7	0.2	1.5	1.0
Norway	4.0	0.1	2.5	1.5
Poland (1990-2002)	3.1	0.5	3.2	-0.6
Portugal	5.9	0.4	2.6	2.8
Slovak Republic (1997-2002)	2.1	0.5	4.2	-1.5
Spain	3.4	0.3	2.3	0.8
Sweden	1.5	0.1	1.7	-0.4
Switzerland (1985-2002)	3.8	0.2	0.8	2.9
Turkey (1984-2002)	11.0	0.3	2.3	8.3
United Kingdom	3.4	0.2	2.3	1.0
United States	4.7	0.1	2.0	2.6
Average	*3.6*	*0.3*	*2.3*	*1.0*

1. Total public health spending per capita.
2. Or the longest overlapping period available.
3. Assuming an income elasticity of health expenditure equal to 1.
Source : OECD Health Database (2004), ENPRI-AGIR and Secretariat calculations.

Table 2.2 **Decomposing growth in public health spending [1], 1970-2002 [2]**

	Health spending	Age effect	Income effect [3]	Residual
Australia (1971-2001)	4.0	0.5	1.7	1.7
Austria	4.2	0.2	2.5	1.5
Belgium (1995-2002)	2.9	0.4	2.2	0.6
Canada	3.1	0.6	2.1	0.4
Czech Republic (1993-2002)	2.7	0.4	2.8	-0.4
Denmark (1971-2002)	1.9	0.2	1.6	0.1
Finland	3.4	0.6	2.4	0.5
France	3.9	0.3	1.9	1.6
Germany	3.7	0.3	1.6	1.9
Greece (1987-2002)	3.4	0.4	2.1	0.8
Hungary (1991-2002)	1.5	0.3	2.8	-1.5
Iceland	6.1	0.1	2.7	3.2
Ireland	5.3	0.0	4.4	0.9
Italy (1988-2002)	2.1	0.7	2.2	-0.1
Japan (1970-2001)	4.9	0.6	2.6	1.8
Korea (1982-2002)	10.1	1.4	6.0	2.4
Luxembourg (1975-2002)	4.2	0.0	3.3	0.7
Mexico (1990-2002)	4.5	0.7	1.7	2.4
Netherlands (1972-2002)	3.3	0.4	2.0	0.9
New Zealand	2.9	0.2	1.2	1.4
Norway	5.4	0.1	3.0	2.2
Poland (1990-2002)	3.1	0.5	3.2	-0.6
Portugal	8.0	0.5	2.9	4.4
Slovak Republic (1997-2002)	2.1	0.5	4.2	-1.5
Spain	5.4	0.4	2.4	2.5
Sweden	2.5	0.3	1.6	0.7
Switzerland (1985-2002)	3.8	0.2	0.9	2.9
Turkey (1984-2002)	11.6	0.3	2.1	8.3
United Kingdom	3.8	0.1	2.1	1.5
United States	5.1	0.3	2.1	2.7
Average	*4.3*	*0.4*	*2.5*	*1.5*

1. Total public health spending per capita.
2. Or the longest overlapping period available.
3. Assuming an income elasticity of health expenditure equal to 1.
Source : OECD Health Database (2004), ENPRI-AGIR and Secretariat calculations.

Table 2.3 Assumptions underlying the alternative projection scenarios: Health care

Scenarios	Health Status	Income elasticity	Expenditure residual
Demographic effect	Healthy ageing: longevity gains are translated into equivalent additional years in good health	Income elasticity is equal to 1	n.a.
Cost-pressure scenario	Healthy ageing: longevity gains are translated into equivalent additional years in good health	Income elasticity is equal to 1	**The expenditure residual grows at 1% per year over the projection period**
Cost-containment scenario	Healthy ageing: longevity gains are translated into equivalent additional years in good health	Income elasticity is equal to 1	Residual growth is equal to 1% in 2005 and converges to 0 by 2050 (transversality condition)
Country-specific residuals	Healthy ageing: longevity gains are translated into equivalent additional years in good health	Income elasticity is equal to 1	**Residual growth is country-specific and converges to 0 by 2050 (transversality condition)**
Income elasticity = 0.8	Healthy ageing: longevity gains are translated into equivalent additional years in good health	**Income elasticity is equal to 0.8**	Residual growth is equal to 1% in 2005 and converges to 0 by 2050 (transversality condition)
Income elasticity = 1.2	Healthy ageing: longevity gains are translated into equivalent additional years in good health	**Income elasticity is equal to 1.2**	Residual growth is equal to 1% in 2005 and converges to 0 by 2050 (transversality condition)
Residuals at 1.5%	Healthy ageing: longevity gains are translated into equivalent additional years in good health	Income elasticity is equal to 1	**Residual growth is equal to 1.5% in 2005 and converges to 0 by 2050 (transversality condition)**
Compression of morbidity	**Longevity gains are doubled into additional years in good health**	Income elasticity is equal to 1	Residual growth is equal to 1% in 2005 and converges to 0 by 2050 (transversality condition)
Expansion of morbidity	**No healthy ageing adjustment, i.e. longevity gains do not translate into additional years in good health**	Income elasticity is equal to 1	Residual growth is equal to 1% in 2005 and converges to 0 by 2050 (transversality condition)

NB: The key assumption changed in each scenario is in bold.

Table 2.4. **Projection scenarios for public health care expenditure** [1]

In % of GDP

					Sensitivity analysis					
		Demographic effect	Cost-pressure	Cost-containment	Country-specific residuals	Income elasticity=0.8	Income elasticity=1.2	Residuals at 1.5%	Compression of morbidity	Expansion of morbidity
	2005 [2]	2050								
Australia	5.6	6.5	9.7	7.9	8.5	7.1	8.9	8.7	7.1	8.7
Austria	3.8	4.4	7.6	5.7	4.4	5.0	6.6	6.6	5.0	6.7
Belgium	5.7	5.8	9.0	7.2	6.7	6.4	8.1	8.0	6.4	8.2
Canada	6.2	7.0	10.2	8.4	7.8	7.6	9.3	9.2	7.9	9.1
Czech Republic	7.0	8.0	11.2	9.4	7.5	8.9	9.9	10.2	8.5	10.3
Denmark	5.3	5.6	8.8	7.0	5.1	6.2	7.9	7.8	6.4	7.6
Finland	3.4	3.8	7.0	5.2	4.1	4.3	6.3	6.0	4.4	6.1
France	7.0	7.3	10.6	8.7	8.7	8.1	9.5	9.6	7.8	9.8
Germany	7.8	8.2	11.4	9.6	9.6	8.9	10.3	10.4	9.0	10.4
Greece	4.9	5.5	8.7	6.9	6.6	6.1	7.9	7.7	6.4	7.5
Hungary	6.7	7.1	10.3	8.5	5.4	7.5	9.6	9.3	7.6	9.6
Iceland	6.8	7.5	10.7	8.9	10.5	7.9	10.1	9.7	8.5	9.3
Ireland	5.9	6.8	10.0	8.2	5.6	6.9	9.8	9.0	7.7	8.8
Italy	6.0	6.5	9.7	7.9	6.4	7.3	8.6	8.7	6.8	9.2
Japan	6.0	7.1	10.3	8.5	8.7	7.9	9.1	9.3	7.9	9.0
Korea	3.0	4.6	7.8	6.0	8.6	5.3	6.9	6.8	4.8	7.3
Luxembourg	6.1	6.6	9.9	8.0	6.6	6.9	9.4	8.9	7.5	8.6
Mexico	3.0	4.3	7.5	5.7	8.3	4.4	7.3	6.5	4.9	6.5
Netherlands	5.1	5.7	8.9	7.0	6.1	6.3	8.0	7.9	6.8	7.4
New Zealand	6.0	6.9	10.1	8.3	8.4	7.6	9.1	9.1	7.7	9.1
Norway	7.3	7.5	10.7	8.9	9.6	8.1	9.8	9.7	8.1	9.7
Poland	4.4	5.3	8.5	6.7	4.6	5.5	8.2	7.5	5.5	8.2
Portugal	6.7	7.7	10.9	9.1	12.6	8.3	10.1	9.9	8.4	9.9
Slovak Republic	5.1	6.5	9.7	7.9	4.9	7.2	8.6	8.7	6.8	9.0
Spain	5.5	6.4	9.6	7.8	7.5	7.1	8.5	8.6	7.2	8.3
Sweden	5.3	5.3	8.5	6.7	4.9	5.9	7.7	7.5	6.3	7.3
Switzerland	6.2	6.4	9.6	7.8	11.4	7.1	8.6	8.6	7.4	8.4
Turkey	5.9	6.7	9.9	8.1	n.a	7.3	9.1	8.9	7.3	9.2
United Kingdom	6.1	6.5	9.7	7.9	7.9	7.1	8.8	8.7	7.1	8.7
United States	6.3	6.5	9.7	7.9	10.8	7.1	8.9	8.7	7.3	8.6
Average	**5.7**	**6.3**	**9.6**	**7.7**	**7.5**	**6.9**	**8.7**	**8.5**	**7.0**	**8.5**

1. For the definition of the different scenarios see table 2.3.
2. Estimates, taking into account the observed expenditure growth between 2000 and 2003 (or 2002 if not available).
Source: Secretariat calculations.

Table 2.5 **Sensitivity analysis of health care expenditure to population projections**

Assuming longevity gains of 2 years per decade

(In % of GDP)

		Healthy ageing	Expansion of morbidity
	2005 [1]	2050	
France	7.0	8.8	9.8
Germany	7.8	9.6	10.7
Italy	6.0	8.1	9.2
Japan	6.0	8.4	9.5
United States	6.3	7.7	8.6
Average	**6.6**	**8.5**	**9.6**

1. Estimates, taking into account the observed expenditure growth between 2000 and 2003 (or 2002 if not available).
Source: Secretariat calculations.

Table 3.1. **Econometric estimates of long-term care costs per dependant**

Log of long-term care cost per dependant	**Fixed effects**	**Robust OLS with age-invariant explanatory variables**	
Age	0.0335*** (0.0014)	0.0348*** (0.0025)	0.0345*** (0.0023)
Participation ratio of people aged 50-64		0.0394*** (0.0054)	0.0378*** (0.0066)
GDP per capita			0.0748 (0.0509)
Constant	6.433*** (0.079)	4.217*** (0.380)	2.356* (1.317)
Number of countries	11		
Number of age groups	20		
Number of Obs.	185		
R-squared	0.77 (within)	0.62	0.62

Note:
*** significant at 1% and * significant at 10 %.
Standard errors in parentheses

Table 3.2 Assumptions underlying the alternative projection scenarios: Long-term care

Scenarios	Health Status	Participation rates (proxy for availability of informal care)	Income and 'cost disease' effects
Demographic effect	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years (approximately half of the projected longevity gains)	n.a.	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero
Cost-pressure scenario	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years	Participation rates of people aged 50-64 increase in line with baseline labour force projections	**Long-term care costs per dependent increase in line with average labour productivity (full Baumol effect)** Income elasticity equal to zero
Cost-containment scenario	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years	Participation rates of people aged 50-64 increase in line with baseline labour force projections	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero
Unitary income elasticity	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years	Participation rates of people aged 50-64 increase in line with baseline labour force projections	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) **Income elasticity equal to one**
Compression of disability	**The prevalence of dependency per age is shifted by 1 year every 10 years**	Participation rates of people aged 50-64 increase in line with baseline labour force projections	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero
Expansion of disability	**No healthy ageing adjustment, i.e. the prevalence of dependency remains constant over time**	Participation rates of people aged 50-64 increase in line with baseline labour force projections	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero
Increase in dependency	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years, but **dependency rates are assumed to increase by 0.5% per year**	Participation rates of people aged 50-64 increase in line with baseline labour force projections	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero
Increased participation	Healthy ageing: the prevalence of dependency per age is shifted by ½ year every 10 years	**Participation rates of people aged 50-64 converge to at least 70% by 2050 in all countries**	Long-term care costs per dependent increase by *half* of average labour productivity (partial Baumol effect) Income elasticity equal to zero

NB: The key assumption changed in each scenario is in bold.

Table 3.3 **Projection scenarios for public long-term care expenditure** [1]

In % of GDP

					Sensitivity analysis				
		Demographic effect	Cost-pressure	Cost-containment	Unitary income elasticity	Compression of disability	Expansion of disability	Increase in dependency	Increased participation
	2005 [2]	2050							
Australia	0.9	2.2	2.9	2.0	2.6	1.5	2.4	3.1	3.2
Austria	1.3	2.5	3.3	2.5	3.0	2.0	2.9	3.6	5.4
Belgium	1.5	2.4	3.4	2.6	3.2	2.2	3.1	3.7	5.9
Canada	1.2	2.3	3.2	2.4	3.0	1.9	2.9	3.6	2.9
Czech Republic	0.4	2.0	2.0	1.3	1.7	0.9	1.8	2.4	3.2
Denmark	2.6	3.3	4.1	3.3	3.9	2.9	3.7	4.2	3.5
Finland	2.9	4.3	5.2	4.2	4.8	3.7	4.6	5.4	4.9
France	1.1	2.3	2.8	2.0	2.5	1.6	2.4	3.0	3.7
Germany	1.0	1.9	2.9	2.2	2.7	1.7	2.7	3.4	3.2
Greece	0.2	1.0	2.8	2.0	2.6	1.4	2.6	3.5	3.0
Hungary	0.3	1.5	2.4	1.0	1.6	0.6	1.3	1.8	5.4
Iceland	2.9	3.5	4.4	3.4	4.1	3.1	3.8	4.3	3.5
Ireland	0.7	1.7	4.6	3.2	3.9	2.5	3.9	4.9	3.7
Italy	0.6	2.0	3.5	2.8	3.3	2.2	3.5	4.5	6.3
Japan	0.9	2.3	3.1	2.4	2.8	1.9	2.9	3.7	2.3
Korea	0.3	4.1	4.1	3.1	3.7	2.3	3.9	5.1	5.1
Luxembourg	0.7	1.6	3.8	2.6	3.3	2.0	3.1	4.0	4.9
Mexico	0.1	2.0	4.2	3.0	3.8	2.2	3.9	5.1	3.7
Netherlands	1.7	2.4	3.7	2.9	3.5	2.4	3.4	4.1	3.9
New Zealand	0.5	2.0	2.4	1.7	2.2	1.2	2.1	2.8	2.1
Norway	2.6	3.3	4.3	3.5	4.1	3.1	3.9	4.5	3.6
Poland	0.5	2.6	3.7	1.8	2.5	1.3	2.2	2.8	6.2
Portugal	0.2	1.3	2.2	1.3	1.9	0.8	1.8	2.4	2.1
Slovak Republic	0.3	2.6	2.6	1.5	2.0	1.1	2.0	2.6	6.6
Spain	0.2	1.0	2.6	1.9	2.3	1.3	2.4	3.3	3.0
Sweden	3.3	3.6	4.3	3.4	4.0	3.2	3.6	4.0	3.6
Switzerland	1.2	1.7	2.6	1.9	2.4	1.5	2.3	2.8	1.9
Turkey	0.1	1.8	1.8	0.8	1.4	0.5	1.2	1.7	6.8
United Kingdom	1.1	2.1	3.0	2.1	2.7	1.7	2.6	3.2	2.6
United States	0.9	1.8	2.7	1.8	2.4	1.4	2.2	2.8	1.9
Average	**1.1**	**2.3**	**3.3**	**2.4**	**2.9**	**1.9**	**2.8**	**3.5**	**3.9**

1. For the definition of the different scenarios see table 3.2.
2. Estimates, taking into account the observed expenditure growth between 2000 and 2003 (or 2002 if not available).
Source: Secretariat calculations.

Table 3.4 **Sensitivity analysis of long-term care expenditure to population projections**

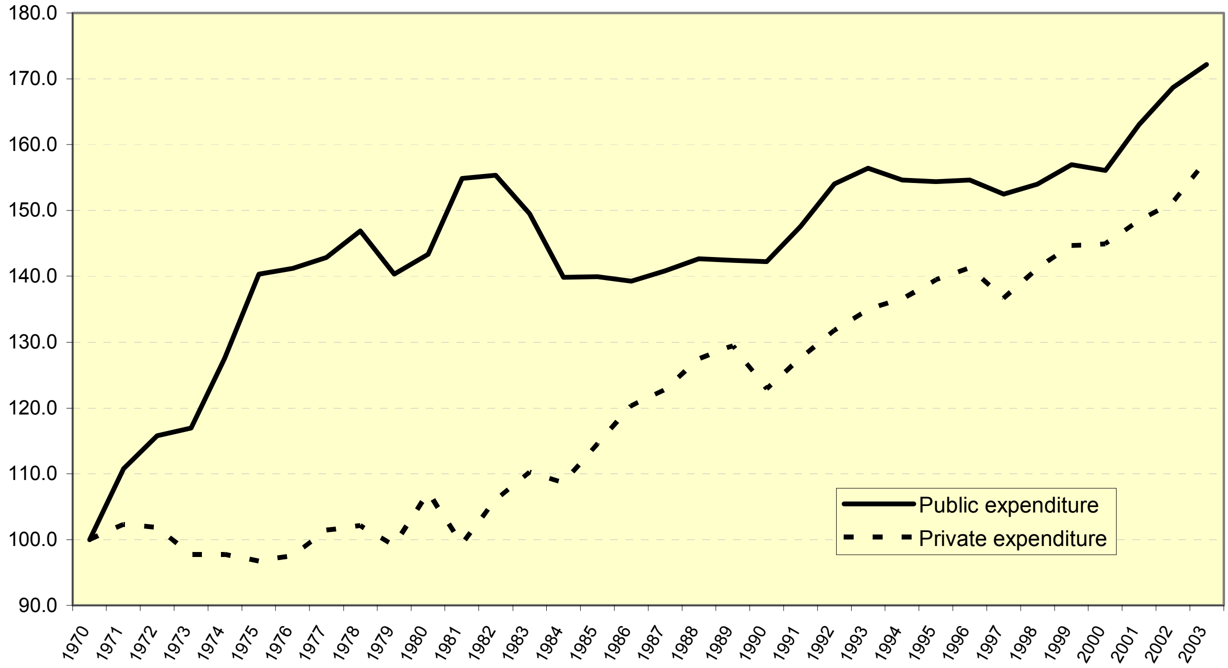
Assuming longevity gains of 2 years per decade

(In % of GDP)

		Healthy ageing	Expansion of disability
	2005 [1]	2050	
France	1.1	2.2	3.1
Germany	1.0	3.0	4.4
Italy	0.6	3.5	5.3
Japan	0.9	3.6	5.2
United States	0.9	1.7	2.6
Average	**0.9**	**2.8**	**4.1**

1. Estimates, taking into account the observed expenditure growth between 2000 and 2003 (or 2002 if not available).
Source: Secretariat calculations.

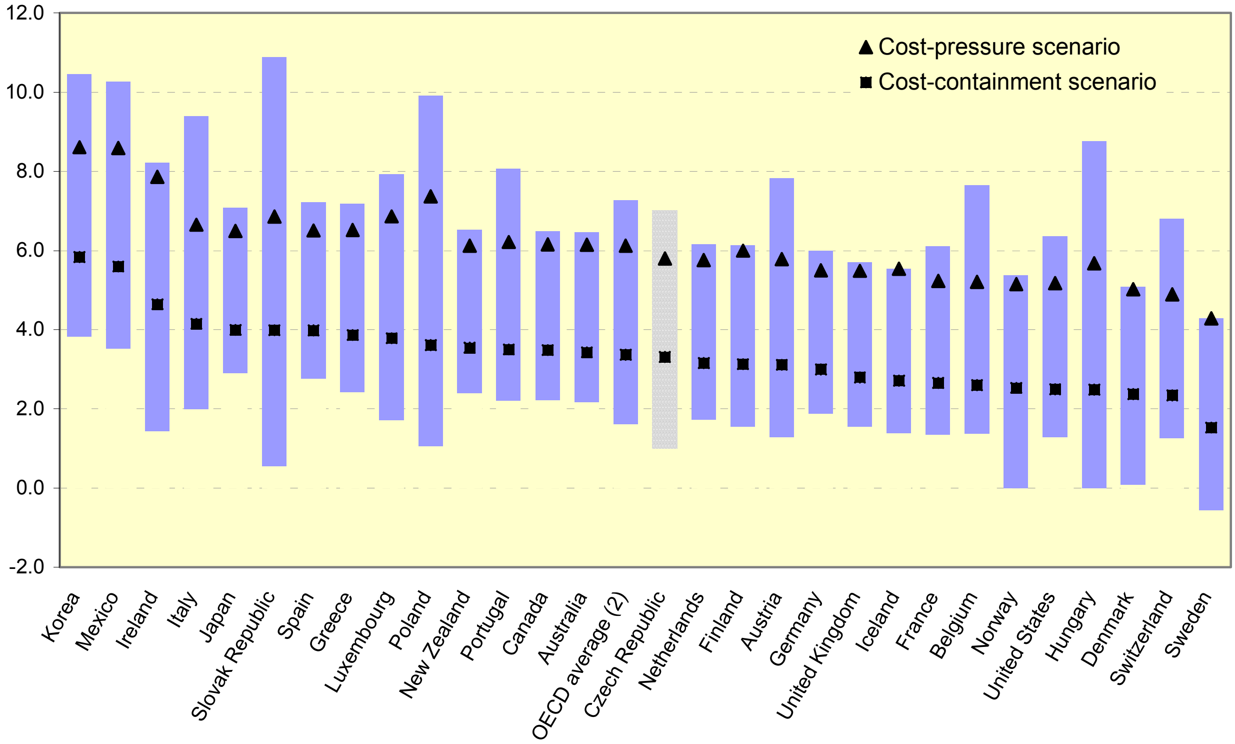
Figure 1.1 **Evolution of public and private OECD health spending** [1]
Index 1970 = 100



1. Unweighted average of available OECD countries. As a % of GDP.
Source : OECD Health Database (2005).

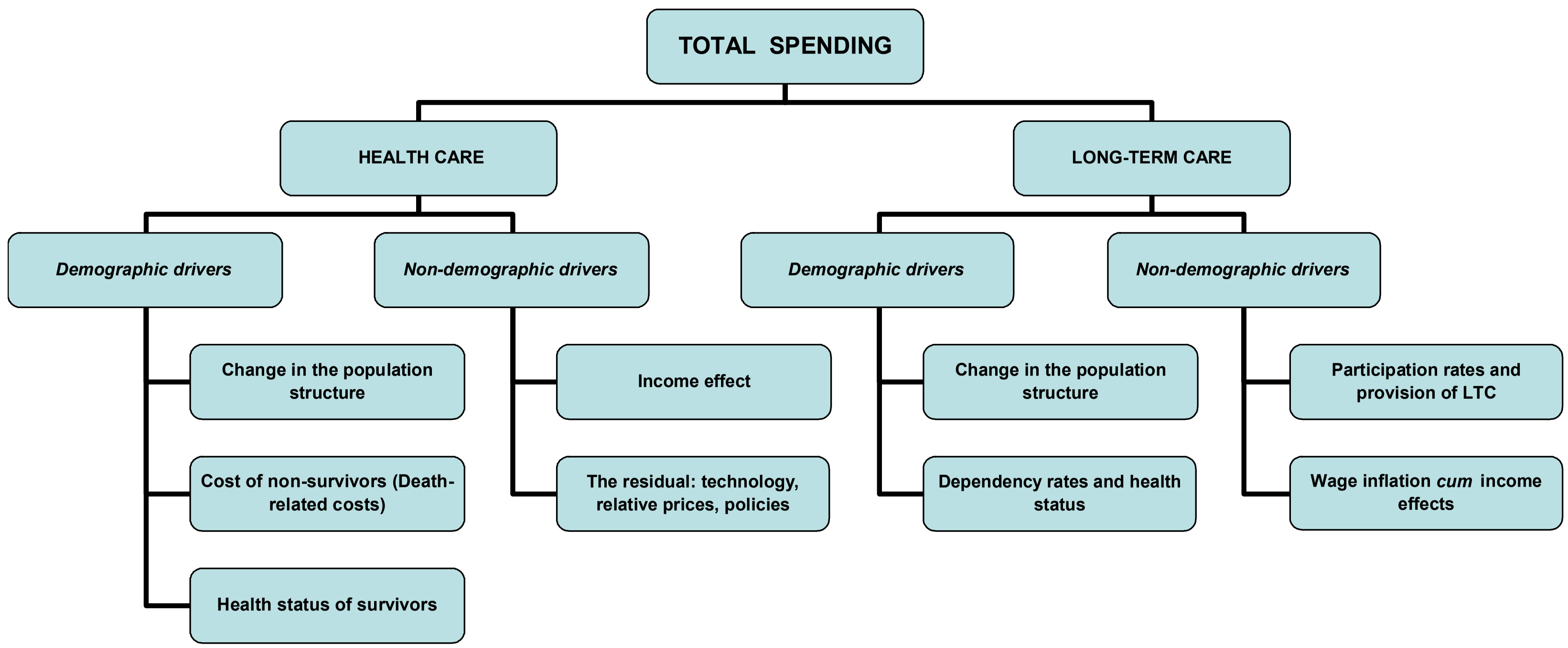
Figure 1.2 **Total increase in health and long-term care spending, 2005-2050** [1]

In percentage points of GDP



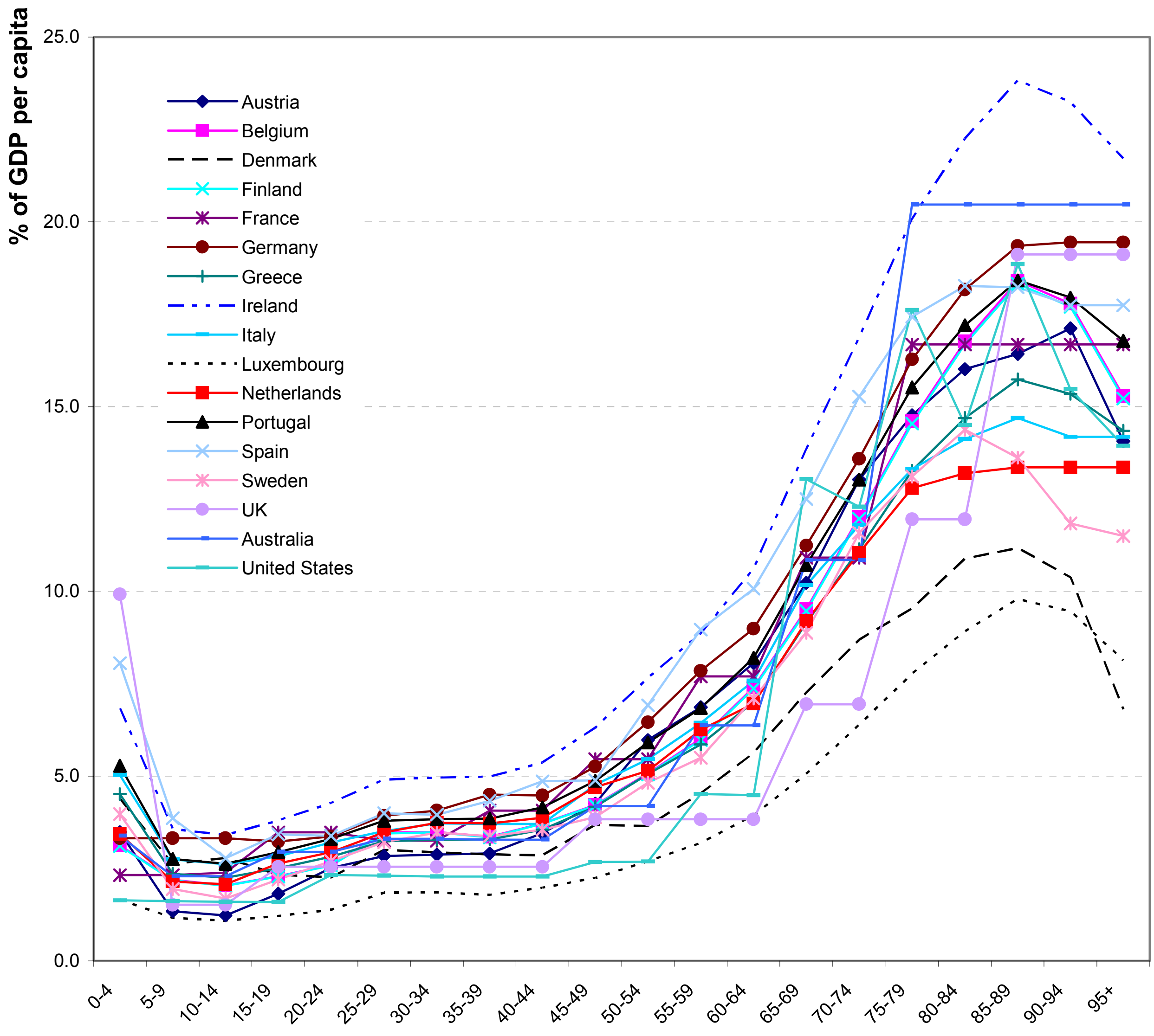
1. The vertical bars correspond to the range of the alternative scenarios, including sensitivity analysis. Countries are ranked by the increase of expenditures between 2005 and 2050 in the cost-containment scenario.
Turkey was not included because it was not possible to calculate one of the scenarios.
2. Excluding Turkey.
Source : Secretariat calculations.

Figure 1.3 **Drivers of total health and long-term care spending: key components**



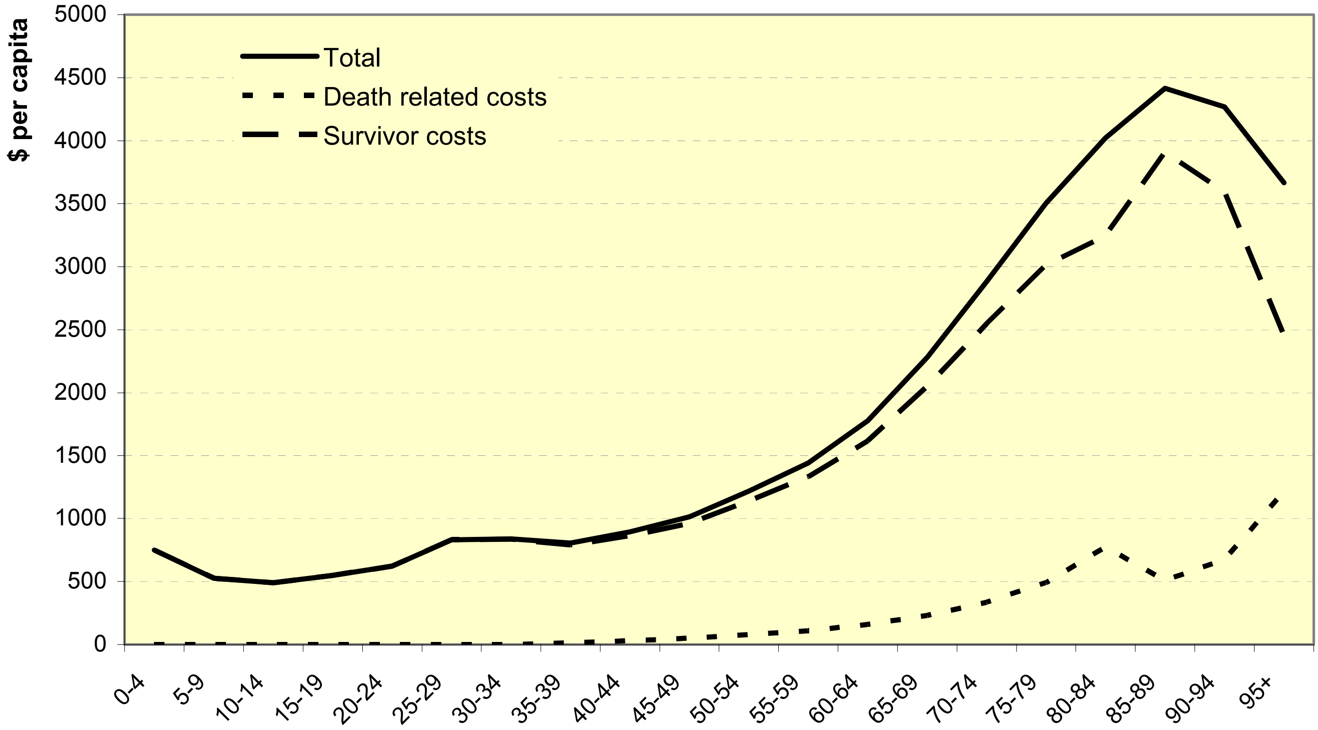
Note: For a definition and description of the different technical terms, see the Glossary in Box 1.

Figure 2.1 **Public health care expenditure by age groups** [1]



1. Expenditure per capita in each age group divided GDP per capita.
Source : ENPRI-AGIR, national authorities and Secretariat calculations.

Figure 2.2 **Breakdown of the health care cost curve** [1]
(Finland)



1. Expenditure per capita in each age group.
Source : ENPRI-AGIR and Secretariat calculations.

Figure 2.3 **Shifts in expenditure profiles, ageing and non-ageing effects**

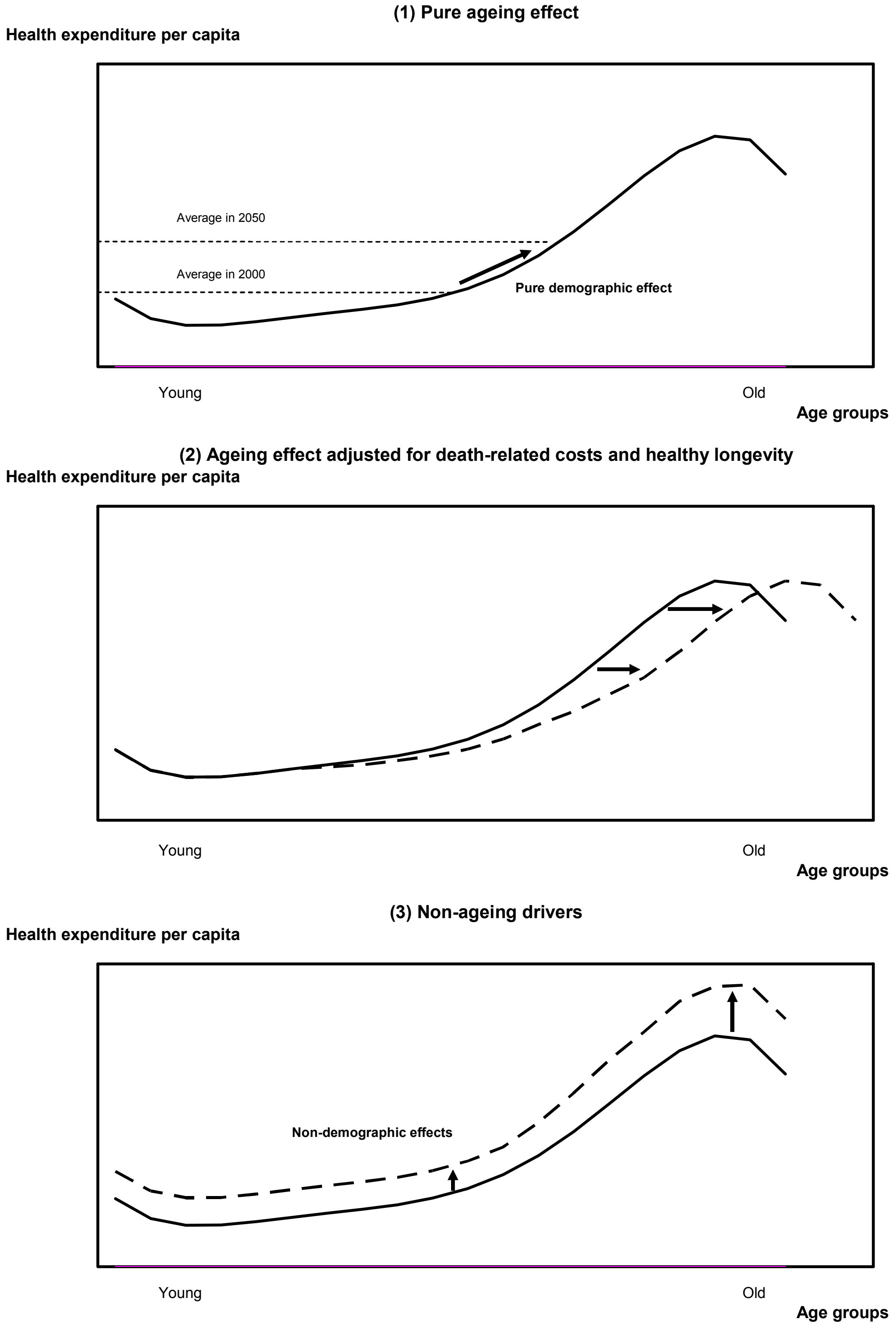
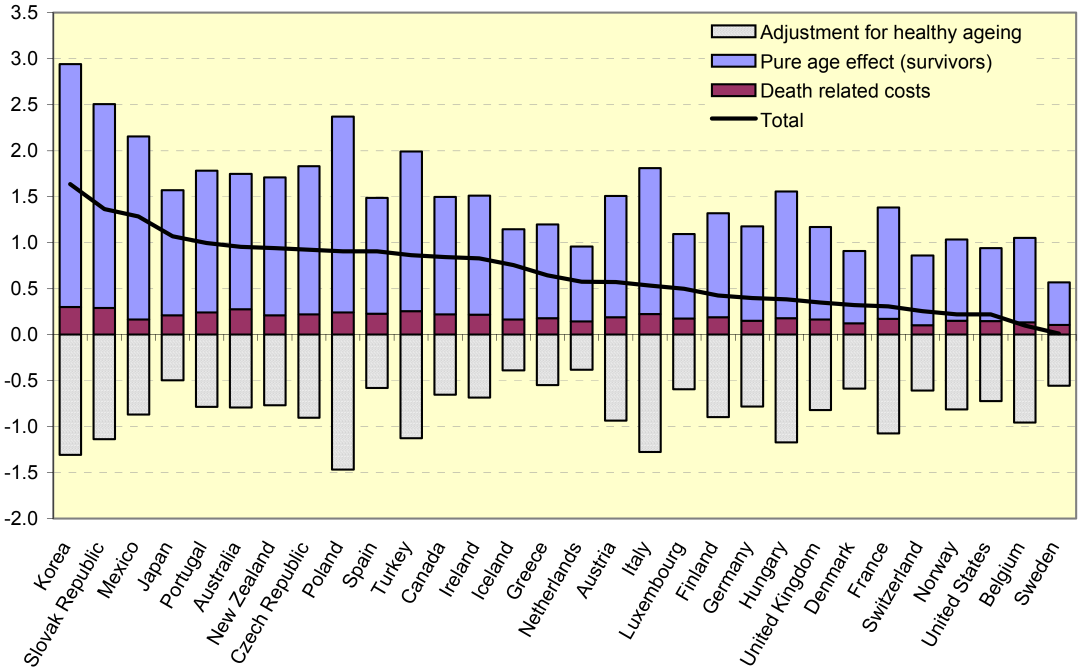


Figure 2.4 **Demographic effects on health care expenditure**

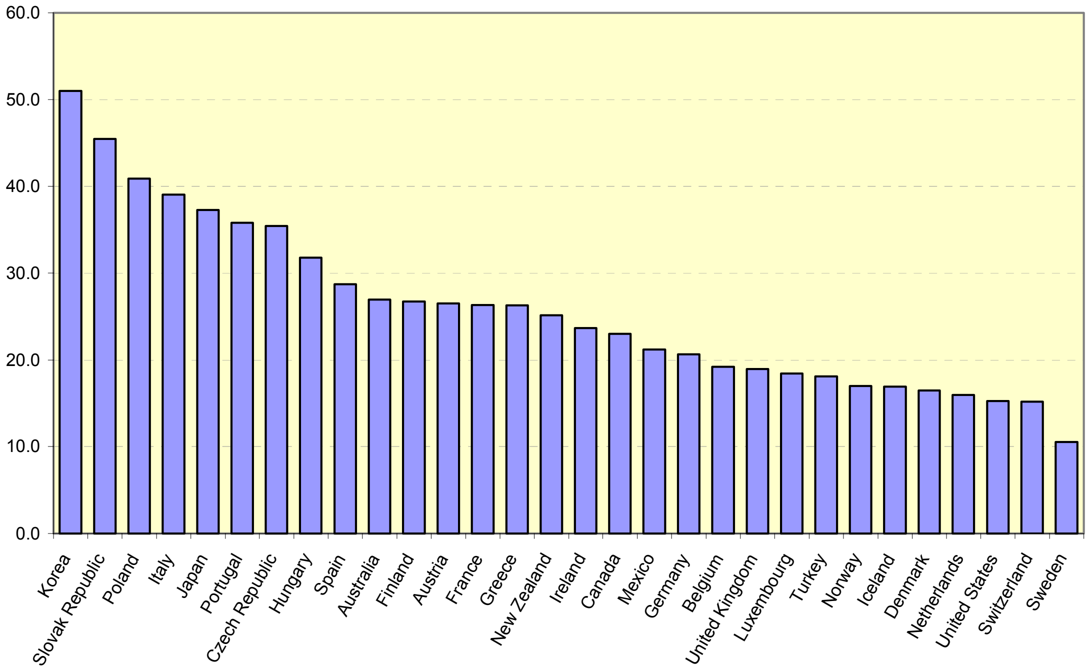
A. **Public health care expenditure**

Increase in % points of GDP 2005-2050



B. **Increase in the old-age dependency ratio between 2005 and 2050** [1]

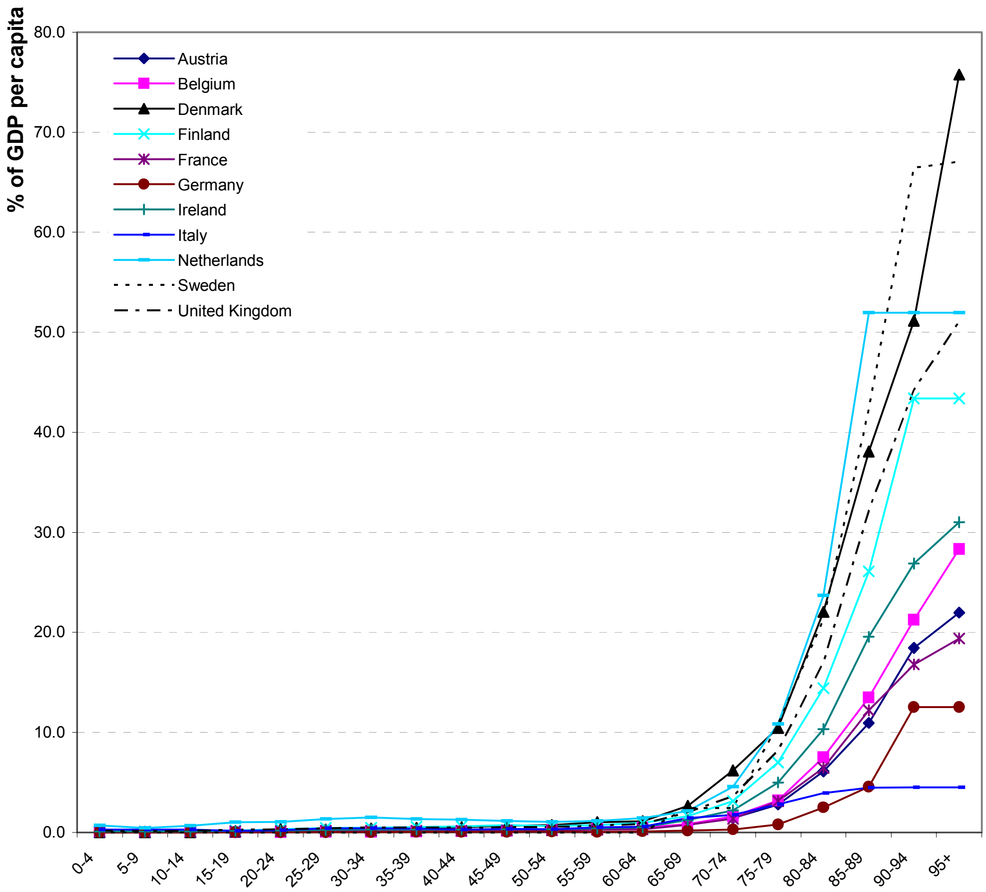
(In percentage points of working age population)



1. Ratio of population aged 65 and over to population aged 15-64.

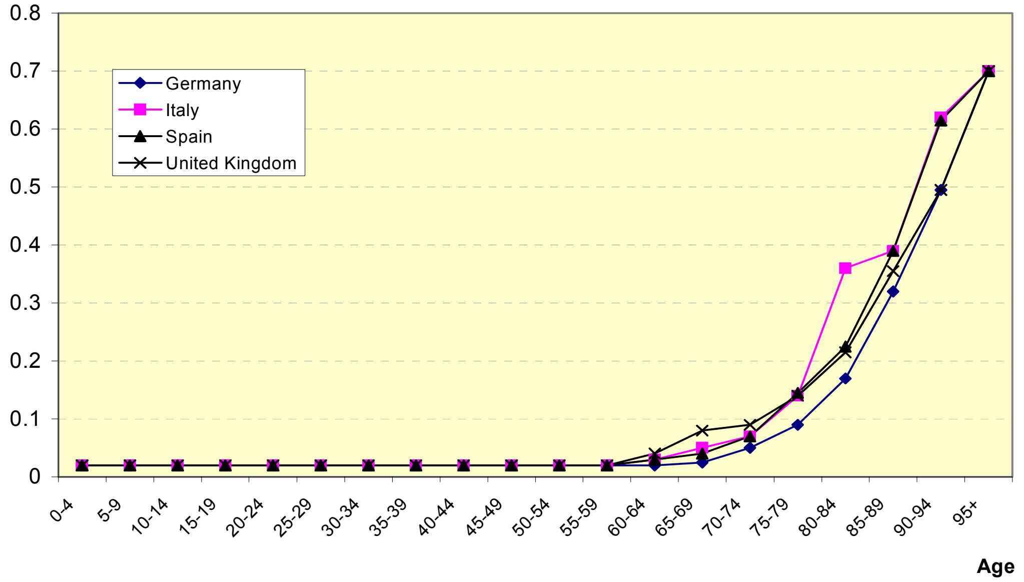
Source : Secretariat calculations.

Figure 3.1. **Public long-term care expenditure by age group** [1]



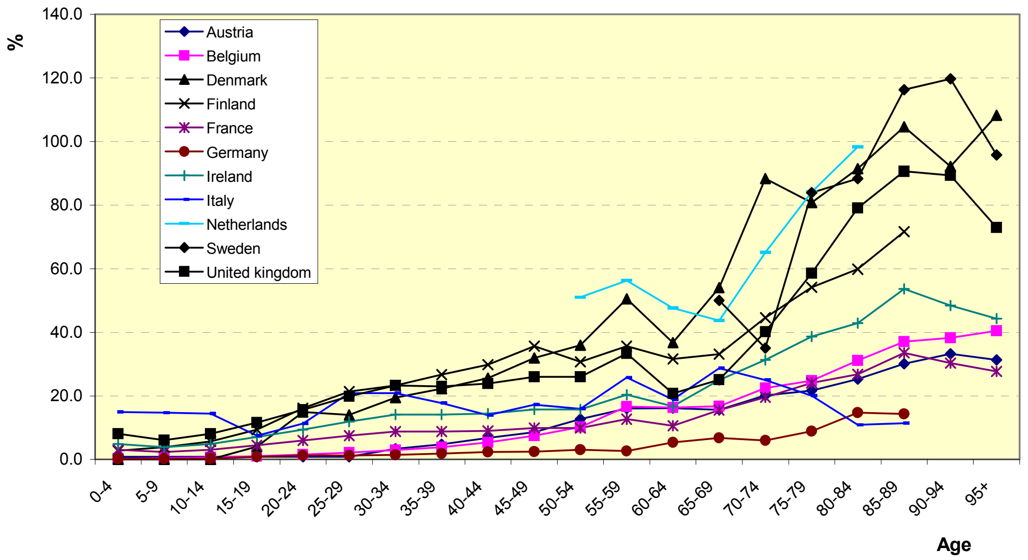
1. Expenditure per capita in each age group divided by GDP per capita.
Source: ENPRI-AGIR and Secretariat calculations.

Figure 3.2 **Prevalence of dependency by age group** [1]



1. Dependency is defined as the inability to accomplish one or several Activities of Daily Living (see text).
Source : Comas-Herrera et al. (2003) and Secretariat calculations.

Figure 3.3. **Adjusted long-term care expenditure per dependant**
(% of GDP per capita)



Source : ENPRI-AGIR and Secretariat calculations.

ANNEX 2A. DATA SOURCES AND METHODS

Macro data

Population (N) and other demographic assumptions:	Past data: Eurostat + United Nations Projections are derived from national sources Projected gains in life expectancy per decade were also derived from national population projections. Mortality rates were derived from national population projections, using a demographic maquette (see Gonand, 2005). The five-year national projections were transformed into annual projection, by linear interpolation. Using these annual data, a mortality rate by cohort and year was derived.
Participation rates $\left(\frac{L}{N}\right)$:	Past participation ratios were obtained from OECD Labour Force Statistics Labour force projections: Burniaux *et al.,* (2003)
Labor productivity $\left(\frac{Y}{L}\right)$:	Productivity growth calculated as the average between 1995-2000, converging to 1.75% per year by 2030, except for former transition countries and Mexico which are assumed to converge by 2050.
GDP per capita $\left(\frac{Y}{N}\right)=\left(\frac{L}{N}\right)\times\left(\frac{Y}{L}\right)$:	Expressed in 2000 $ PPPs.

65. Table A2.1 provides summary statistics on the main exogenous assumptions used in the projections.

[Table A2.1 Exogenous assumptions underlying the projections]

Health care

Estimating the death-related costs

66. The primary data for 18 OECD countries are drawn from the AGIR data set (Westerhout and Pellikaan, 2005, based on EPC, 2001) for EU-15 countries and from national sources for Australia, Canada and United States.

67. The cost of death for the oldest group (95+) is assumed to be the lowest and was proxied by their observed health expenditure per person when available. For France, Germany, Italy, United Kingdom, Spain, Netherlands and Australia for which the expenditure for the oldest group were not available, the cost of people aged 75-79 was taken as a proxy. In fact, when available, expenditure at age 95+ is roughly equal to the level of expenditure at age 75-79. For the countries where no cost expenditures were available, the cost of death for the oldest group was estimated by taking 3 times the average health expenditure per capita.

68. The costs of death for other age groups are then derived by multiplying this estimate by an adjustment factor equal to four between ages 0-4 to 55-59, gradually decreasing to 1 afterwards. Multiplying these costs of death by the estimated number of deaths by age group (using mortality data) gives the death-related cost (DRC) curve.

Estimating the survivors' expenditure curves

69. The cost curve for *survivors* can be simply derived by subtracting the DRC curve described above from the total expenditure curves, when available (18 OECD countries). Given the uncertainties surrounding these data, it seemed nonetheless preferable to estimate an average expenditure curve for survivors and then use this curve for all countries. In this way, the projections are less sensitive to initial conditions and to country-specific data idiosyncrasies.

70. An average expenditure curve for *survivors* was estimated econometrically in a panel of 18 countries by 20 age groups, using a spline function, as follows (see Table A2.2):

$$\left.\frac{\text{Health Exp.}}{\text{Population}}\right|_{age\ group} = -137.8 \cdot age + 9.94 \cdot age^{2} - 0.29 \cdot age^{3} + 0.004 \cdot age^{4} - 0.00002 \cdot age^{5} + 1222.6$$

where *age* is the central point in each age bracket (*e.g.*, 2, 7, 12,…, 97).

[Table A2.2 Econometric estimates of an average health expenditure curve]

Calibration of the cost curves on the OECD Health database

71. The cost curves derived for 2000 were calibrated in order to fit the year 2005, the starting point of the projections. The total health and long-term care expenditures for 2005 being not yet available in the OECD Health Data (2005a), an estimate was made by applying the observed growth rate in expenditures 2000-2003 (or 2002, depending on the countries) for the whole period 2000-2005. A second step was to split the total spending into health and long-term care. The details of this split are provided below and involved an estimate of the shares of long-term care expenditures using OECD (2005b).

72. The costs of death by age group for 2005 were derived by applying the same growth rate as the total health expenditures between 2000 and 2005. The total death-related costs in 2005 were computed as the product of the cost of death by the projected number of deaths by age group in that year. The total survivor expenditures were then derived by subtracting the total death-related costs from the total health spending. Using this information, the survivor cost curve was calibrated proportionally for each age group.

Projecting the demographic effects under a 'healthy ageing' scenario

73. Shifting the survivor cost curve according to longevity gains involves two steps:

(1) The survivor expenditure curve by five-year age groups is interpolated in order to derive a profile by individual age. In this way, the cost curve can be shifted smoothly over time in line with life expectancy gains.

(2) An "effective age" is calculated by subtracting the increase in life expectancy at birth according to national projections from current age. For example, a 70-year old person in Germany is projected to have an effective age of 67 by 2025 and 64 by 2050.

74. The death-related cost curve remains constant over time (to isolate the demographic effect) and the costs of death are projected according to the number of deaths.

Long-term care (LTC)

Expenditure curves

75. Expenditure curves for eleven EU-countries were obtained from the AGIR data set (Westerhout and Pellikaan, 2005, based on EPC, 2001). An average dependency ratio (prevalence of dependency by age group) was derived from Comas-Herrera (2003) study for four countries (United Kingdom, Spain, Italy, Germany). As the Comas-Herrera study only provides dependency ratios for old ages, this ratio was assumed to start at 2% for younger ages.

76. More precisely, the LTC expenditures per dependant were derived as follows:

$$\left.\frac{LTC}{dependant}\right|_{age\ group} = \left.\frac{LTC}{population}\right|_{age\ group} \times \left.\frac{1}{dependency\ ratio}\right|_{age\ group}$$

where $dependency\ ratio = \left.\dfrac{number\ of\ dependants}{total\ population}\right|_{age\ group}$

77. An average LTC expenditure curve per dependant and age group was estimated using the following equation (see Table 3.1, in the main text):

$$Log\left(\frac{LTC}{dependant}\right) = 4.217 + 0.0348 \cdot age + 0.0394 \cdot (Labour\ Force\ participat\,ion\ ratio\ of\ 50-64)$$

78. This equation was used to derive the shit in the LTC cost curve associated with changes in the participation ratios in OECD. With these expenditure curves per dependant, the total LTC costs can be calculated as follows:

$$Total\ LTC = \sum_i \left[\left.\frac{LTC}{dependant}\right|_{age\,group\,i} \cdot number\ of\ dependants\Big|_{age\ group\,i} \right]$$

79. The total LTC expenditure in percentage of GDP in 2000 was calibrated to fit the estimates of the OECD Long-term Care study (OECD, 2005b), when available. Data for the countries not available in this study were obtained by applying the ratios of LTC to GDP observed in 'similar' benchmark countries, as indicated in the table below:

Country estimated	*Benchmark countries*
Belgium	Netherlands
Czech Republic	*average* (Hungary, Poland)
Slovak Republic	*average* (Hungary, Poland)
Denmark	*average* (Norway, Sweden)
Finland	*average* (Norway, Sweden)
Iceland	*average* (Norway, Sweden)
France	Germany
Greece	Spain
Italy	*average* (Germany, Spain)
Portugal	Spain
Switzerland	Germany
Turkey	Mexico

The starting point of the projections

80. The projected changes in spending expressed in percentage of GDP were calculated from a common base applied to all OECD countries. This base was taken as the OECD average of expenditure in 2005. These changes were added to the initial level of expenditures in each country. This approach makes the projected changes (expressed in percent of GDP) less dependent from the base year levels and also allows for a certain catch-up of expenditure ratios across countries. More precisely, the variation of the share of expenditure to GDP in country *j* between, say, 2005 and 2050, is calculated as:

$$\Delta\left(\frac{Expenditure}{GDP}\bigg|_{\substack{country\ j\\ 2050-2005}}\right) = \exp\left[\Delta \log(Drivers)\Big|_{\substack{country\ j\\ 2050-2005}} + \log\left(\frac{Expenditure}{GDP}\bigg|_{\substack{average OECD\\ year=2005}}\right)\right] - \left(\frac{Expenditure}{GDP}\bigg|_{\substack{average OECD\\ year=2005}}\right)$$

Detailed results for the projection scenarios

81. A detailed breakdown of the projections for each expenditure driver and scenario is provided in Table A2.3 for health care expenditure and in Table A2.4 for long-term care expenditure.

[Table A2.3 Breakdown of the projections of public health expenditure for each driver]
[Table A2.4 Breakdown of the projections of long-term care expenditure for each driver]

Table A2.1 Exogenous assumptions underlying the projections

	Gains in life expectancy at birth	Labour force		Productivity		GDP per capita [1]		Participation rate of people aged 50-64	
	In number of years per decade	Average annual growth		Average annual growth		Average annual growth		Percentages	
	2000-2050	2005-2025	2025-2050	2005-2025	2025-2050	2005-2025	2025-2050	2005	2050
Australia	1.2	0.6	0.0	2.2	1.8	2.2	1.4	60.5	57.8
Austria	1.4	-0.3	-0.5	2.0	1.8	1.7	1.4	46.7	46.7
Belgium	1.6	0.0	-0.2	1.9	1.8	1.7	1.5	45.1	48.0
Canada	0.9	0.3	-0.1	2.0	1.8	1.8	1.6	64.2	65.6
Czech Republic	1.3	-0.4	-1.1	1.5	1.7	1.1	0.9	56.4	49.4
Denmark	1.1	-0.4	-0.3	2.0	1.8	1.7	1.6	66.4	65.7
Finland	1.5	-0.5	-0.4	2.6	1.8	2.3	1.7	63.8	62.8
France	1.8	-0.2	-0.2	1.8	1.8	1.3	1.5	58.0	54.6
Germany	1.2	-0.3	-0.6	1.5	1.8	1.2	1.5	59.6	63.3
Greece	0.8	0.1	-0.9	2.0	1.8	2.4	1.3	54.4	65.1
Hungary	1.6	-0.7	-1.1	2.9	2.1	2.5	1.6	41.4	34.1
Iceland	0.6	0.6	0.1	2.5	1.8	2.8	1.6	88.6	87.8
Ireland	0.9	0.9	0.0	3.5	1.8	4.4	1.7	62.4	76.5
Italy	1.8	-0.2	-1.0	1.5	1.8	1.3	1.2	44.6	52.5
Japan	0.8	-0.6	-1.0	1.5	1.8	1.0	1.4	72.2	72.7
Korea	1.7	-0.5	-1.1	2.4	1.8	2.0	1.4	62.9	57.2
Luxembourg	1.1	1.0	0.5	3.2	1.8	3.6	1.6	48.3	57.8
Mexico	1.2	1.8	0.3	2.6	2.0	3.6	2.2	60.4	67.7
Netherlands	0.5	0.1	0.0	1.8	1.8	1.6	1.7	56.9	63.0
New Zealand	1.2	0.3	-0.1	1.8	1.8	1.5	1.4	70.5	66.8
Norway	1.5	0.4	0.2	1.9	1.8	1.8	1.6	77.2	80.3
Poland	2.0	-0.5	-1.6	3.7	2.4	3.7	1.9	46.7	38.4
Portugal	1.1	-0.1	-0.9	2.2	1.8	2.3	1.3	64.4	64.6
Slovak Republic	1.5	-0.5	-1.4	2.4	1.9	1.9	1.0	48.7	38.6
Spain	0.8	0.1	-0.7	1.6	1.8	1.4	1.3	54.1	63.2
Sweden	0.9	-0.1	0.2	2.3	1.8	1.9	1.8	73.2	68.9
Switzerland	0.9	0.0	-0.3	1.7	1.8	1.5	1.6	72.7	75.1
Turkey	1.6	0.6	-0.1	2.4	1.8	2.3	1.4	35.3	23.6
United Kingdom	1.6	0.0	-0.1	2.1	1.8	1.9	1.6	62.8	63.3
United States	1.4	0.5	0.7	2.1	1.8	1.9	1.7	68.8	69.0

1. Derived GDP per capita using the labour force and productivity assumptions and demographic projections for total population.
Source : National population projections, Burniaux et al. (2003) and Secretariat's calculations.

Table A2.2. Econometric estimates of an average health expenditure curve

Dependant variable: Health expenditure per capita in each age group	Coefficients	t-statistic
age	-137.8	-3.60
age**2	9.94	4.12
age**3	-.29	-4.71
age**4	.004	5.53
age**5	-.00002	-6.32
Constant	1222.6	6.69
Number of observations: 360 R. squared: 0.78		

Table A2.3 Breakdown of the projections of public health care expenditure for each driver

	Health expenditure as a % of GDP		Demographic effect: Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.0	0.0	0.5	0.3	1.5	-0.8	0.0	0.0	1.0	6.5
Austria	3.8	3.8	0.1	0.6	-0.4	0.0	0.0	0.3	0.2	1.3	-0.9	0.0	0.0	0.6	4.4
Belgium	4.9	5.7	0.1	0.5	-0.5	0.0	0.0	0.0	0.1	0.9	-1.0	0.0	0.0	0.1	5.8
Canada	5.3	6.2	0.1	0.8	-0.3	0.0	0.0	0.7	0.2	1.3	-0.7	0.0	0.0	0.8	7.0
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.0	0.0	0.4	0.2	1.6	-0.9	0.0	0.0	0.9	8.0
Denmark	4.6	5.3	0.1	0.5	-0.4	0.0	0.0	0.2	0.1	0.8	-0.6	0.0	0.0	0.3	5.6
Finland	2.7	3.4	0.1	0.8	-0.4	0.0	0.0	0.5	0.2	1.1	-0.9	0.0	0.0	0.4	3.8
France	6.2	7.0	0.1	0.6	-0.5	0.0	0.0	0.2	0.2	1.2	-1.1	0.0	0.0	0.3	7.3
Germany	7.4	7.8	0.1	0.6	-0.4	0.0	0.0	0.2	0.2	1.0	-0.8	0.0	0.0	0.4	8.2
Greece	5.0	4.9	0.1	0.5	-0.3	0.0	0.0	0.3	0.2	1.0	-0.6	0.0	0.0	0.6	5.5
Hungary	4.8	6.7	0.1	0.7	-0.6	0.0	0.0	0.3	0.2	1.4	-1.2	0.0	0.0	0.4	7.1
Iceland	5.4	6.8	0.1	0.6	-0.3	0.0	0.0	0.4	0.2	1.0	-0.4	0.0	0.0	0.8	7.5
Ireland	4.2	5.9	0.1	0.5	-0.2	0.0	0.0	0.4	0.2	1.3	-0.7	0.0	0.0	0.8	6.8
Italy	5.3	6.0	0.1	0.7	-0.5	0.0	0.0	0.3	0.2	1.6	-1.3	0.0	0.0	0.5	6.5
Japan	5.3	6.0	0.1	0.8	-0.3	0.0	0.0	0.7	0.2	1.4	-0.5	0.0	0.0	1.1	7.1
Korea	2.0	3.0	0.2	1.3	-0.6	0.0	0.0	0.9	0.3	2.6	-1.3	0.0	0.0	1.6	4.6
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.0	0.0	0.1	0.2	0.9	-0.6	0.0	0.0	0.5	6.6
Mexico	2.5	3.0	0.1	0.7	-0.3	0.0	0.0	0.5	0.2	2.0	-0.9	0.0	0.0	1.3	4.3
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.0	0.0	0.4	0.1	0.8	-0.4	0.0	0.0	0.6	5.7
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.0	0.0	0.5	0.2	1.5	-0.8	0.0	0.0	0.9	6.9
Norway	5.2	7.3	0.1	0.5	-0.4	0.0	0.0	0.2	0.2	0.9	-0.8	0.0	0.0	0.2	7.5
Poland	3.6	4.4	0.1	1.0	-0.6	0.0	0.0	0.6	0.2	2.1	-1.5	0.0	0.0	0.9	5.3
Portugal	6.2	6.7	0.1	0.6	-0.4	0.0	0.0	0.3	0.2	1.5	-0.8	0.0	0.0	1.0	7.7
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.0	0.0	0.6	0.3	2.2	-1.1	0.0	0.0	1.4	6.5
Spain	5.1	5.5	0.1	0.5	-0.3	0.0	0.0	0.3	0.2	1.3	-0.6	0.0	0.0	0.9	6.4
Sweden	4.5	5.3	0.1	0.4	-0.3	0.0	0.0	0.2	0.1	0.5	-0.6	0.0	0.0	0.0	5.3
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.0	0.0	0.3	0.1	0.8	-0.6	0.0	0.0	0.3	6.4
Turkey	4.1	5.9	0.1	0.6	-0.4	0.0	0.0	0.3	0.3	1.7	-1.1	0.0	0.0	0.9	6.7
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.0	0.0	0.2	0.2	1.0	-0.8	0.0	0.0	0.3	6.5
United States	5.1	6.3	0.1	0.6	-0.4	0.0	0.0	0.3	0.1	0.8	-0.7	0.0	0.0	0.2	6.5
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.0**	**0.0**	**0.4**	**0.2**	**1.3**	**-0.8**	**0.0**	**0.0**	**0.7**	**6.3**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Cost-pressure scenario

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.0	1.3	1.8	0.3	1.5	-0.8	0.0	3.2	4.2	9.7
Austria	3.8	3.8	0.1	0.6	-0.4	0.0	1.3	1.5	0.2	1.3	-0.9	0.0	3.2	3.8	7.6
Belgium	4.9	5.7	0.1	0.5	-0.5	0.0	1.3	1.3	0.1	0.9	-1.0	0.0	3.2	3.3	9.0
Canada	5.3	6.2	0.1	0.8	-0.3	0.0	1.3	1.9	0.2	1.3	-0.7	0.0	3.2	4.1	10.2
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.0	1.3	1.7	0.2	1.6	-0.9	0.0	3.2	4.1	11.2
Denmark	4.6	5.3	0.1	0.5	-0.4	0.0	1.3	1.5	0.1	0.8	-0.6	0.0	3.2	3.5	8.8
Finland	2.7	3.4	0.1	0.8	-0.4	0.0	1.3	1.8	0.2	1.1	-0.9	0.0	3.2	3.6	7.0
France	6.2	7.0	0.1	0.6	-0.5	0.0	1.3	1.5	0.2	1.2	-1.1	0.0	3.2	3.5	10.6
Germany	7.4	7.8	0.1	0.6	-0.4	0.0	1.3	1.5	0.2	1.0	-0.8	0.0	3.2	3.6	11.4
Greece	5.0	4.9	0.1	0.5	-0.3	0.0	1.3	1.6	0.2	1.0	-0.6	0.0	3.2	3.9	8.7
Hungary	4.8	6.7	0.1	0.7	-0.6	0.0	1.3	1.5	0.2	1.4	-1.2	0.0	3.2	3.6	10.3
Iceland	5.4	6.8	0.1	0.6	-0.3	0.0	1.3	1.7	0.2	1.0	-0.4	0.0	3.2	4.0	10.7
Ireland	4.2	5.9	0.1	0.5	-0.2	0.0	1.3	1.6	0.2	1.3	-0.7	0.0	3.2	4.0	10.0
Italy	5.3	6.0	0.1	0.7	-0.5	0.0	1.3	1.6	0.2	1.6	-1.3	0.0	3.2	3.8	9.7
Japan	5.3	6.0	0.1	0.8	-0.3	0.0	1.3	1.9	0.2	1.4	-0.5	0.0	3.2	4.3	10.3
Korea	2.0	3.0	0.2	1.3	-0.6	0.0	1.3	2.1	0.3	2.6	-1.3	0.0	3.2	4.9	7.8
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.0	1.3	1.4	0.2	0.9	-0.6	0.0	3.2	3.7	9.9
Mexico	2.5	3.0	0.1	0.7	-0.3	0.0	1.3	1.7	0.2	2.0	-0.9	0.0	3.2	4.5	7.5
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.0	1.3	1.7	0.1	0.8	-0.4	0.0	3.2	3.8	8.9
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.0	1.3	1.8	0.2	1.5	-0.8	0.0	3.2	4.2	10.1
Norway	5.2	7.3	0.1	0.5	-0.4	0.0	1.3	1.4	0.2	0.9	-0.8	0.0	3.2	3.4	10.7
Poland	3.6	4.4	0.1	1.0	-0.6	0.0	1.3	1.8	0.2	2.1	-1.5	0.0	3.2	4.1	8.5
Portugal	6.2	6.7	0.1	0.6	-0.4	0.0	1.3	1.6	0.2	1.5	-0.8	0.0	3.2	4.2	10.9
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.0	1.3	1.9	0.3	2.2	-1.1	0.0	3.2	4.6	9.7
Spain	5.1	5.5	0.1	0.5	-0.3	0.0	1.3	1.6	0.2	1.3	-0.6	0.0	3.2	4.1	9.6
Sweden	4.5	5.3	0.1	0.4	-0.3	0.0	1.3	1.4	0.1	0.5	-0.6	0.0	3.2	3.2	8.5
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.0	1.3	1.6	0.1	0.8	-0.6	0.0	3.2	3.5	9.6
Turkey	4.1	5.9	0.1	0.6	-0.4	0.0	1.3	1.6	0.3	1.7	-1.1	0.0	3.2	4.1	9.9
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.0	1.3	1.4	0.2	1.0	-0.8	0.0	3.2	3.6	9.7
United States	5.1	6.3	0.1	0.6	-0.4	0.0	1.3	1.5	0.1	0.8	-0.7	0.0	3.2	3.4	9.7
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.0**	**1.3**	**1.6**	**0.2**	**1.3**	**-0.8**	**0.0**	**3.2**	**3.9**	**9.6**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 1
Residuals = 1 NO transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Cost-containment scenario

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.0	0.9	1.5	0.3	1.5	-0.8	0.0	1.4	2.3	7.9
Austria	3.8	3.8	0.1	0.6	-0.4	0.0	0.9	1.2	0.2	1.3	-0.9	0.0	1.4	2.0	5.7
Belgium	4.9	5.7	0.1	0.5	-0.5	0.0	0.9	1.0	0.1	0.9	-1.0	0.0	1.4	1.5	7.2
Canada	5.3	6.2	0.1	0.8	-0.3	0.0	0.9	1.6	0.2	1.3	-0.7	0.0	1.4	2.2	8.4
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.0	0.9	1.3	0.2	1.6	-0.9	0.0	1.4	2.3	9.4
Denmark	4.6	5.3	0.1	0.5	-0.4	0.0	0.9	1.1	0.1	0.8	-0.6	0.0	1.4	1.7	7.0
Finland	2.7	3.4	0.1	0.8	-0.4	0.0	0.9	1.5	0.2	1.1	-0.9	0.0	1.4	1.8	5.2
France	6.2	7.0	0.1	0.6	-0.5	0.0	0.9	1.1	0.2	1.2	-1.1	0.0	1.4	1.7	8.7
Germany	7.4	7.8	0.1	0.6	-0.4	0.0	0.9	1.2	0.2	1.0	-0.8	0.0	1.4	1.8	9.6
Greece	5.0	4.9	0.1	0.5	-0.3	0.0	0.9	1.3	0.2	1.0	-0.6	0.0	1.4	2.0	6.9
Hungary	4.8	6.7	0.1	0.7	-0.6	0.0	0.9	1.2	0.2	1.4	-1.2	0.0	1.4	1.8	8.5
Iceland	5.4	6.8	0.1	0.6	-0.3	0.0	0.9	1.3	0.2	1.0	-0.4	0.0	1.4	2.1	8.9
Ireland	4.2	5.9	0.1	0.5	-0.2	0.0	0.9	1.3	0.2	1.3	-0.7	0.0	1.4	2.2	8.2
Italy	5.3	6.0	0.1	0.7	-0.5	0.0	0.9	1.2	0.2	1.6	-1.3	0.0	1.4	1.9	7.9
Japan	5.3	6.0	0.1	0.8	-0.3	0.0	0.9	1.6	0.2	1.4	-0.5	0.0	1.4	2.5	8.5
Korea	2.0	3.0	0.2	1.3	-0.6	0.0	0.9	1.8	0.3	2.6	-1.3	0.0	1.4	3.0	6.0
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.0	0.9	1.0	0.2	0.9	-0.6	0.0	1.4	1.9	8.0
Mexico	2.5	3.0	0.1	0.7	-0.3	0.0	0.9	1.4	0.2	2.0	-0.9	0.0	1.4	2.7	5.7
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.0	0.9	1.4	0.1	0.8	-0.4	0.0	1.4	2.0	7.0
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.0	0.9	1.5	0.2	1.5	-0.8	0.0	1.4	2.3	8.3
Norway	5.2	7.3	0.1	0.5	-0.4	0.0	0.9	1.1	0.2	0.9	-0.8	0.0	1.4	1.6	8.9
Poland	3.6	4.4	0.1	1.0	-0.6	0.0	0.9	1.5	0.2	2.1	-1.5	0.0	1.4	2.3	6.7
Portugal	6.2	6.7	0.1	0.6	-0.4	0.0	0.9	1.3	0.2	1.5	-0.8	0.0	1.4	2.4	9.1
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.0	0.9	1.5	0.3	2.2	-1.1	0.0	1.4	2.8	7.9
Spain	5.1	5.5	0.1	0.5	-0.3	0.0	0.9	1.3	0.2	1.3	-0.6	0.0	1.4	2.3	7.8
Sweden	4.5	5.3	0.1	0.4	-0.3	0.0	0.9	1.1	0.1	0.5	-0.6	0.0	1.4	1.4	6.7
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.0	0.9	1.3	0.1	0.8	-0.6	0.0	1.4	1.6	7.8
Turkey	4.1	5.9	0.1	0.6	-0.4	0.0	0.9	1.3	0.3	1.7	-1.1	0.0	1.4	2.3	8.1
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.0	0.9	1.1	0.2	1.0	-0.8	0.0	1.4	1.7	7.9
United States	5.1	6.3	0.1	0.6	-0.4	0.0	0.9	1.2	0.1	0.8	-0.7	0.0	1.4	1.6	7.9
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.0**	**0.9**	**1.3**	**0.2**	**1.3**	**-0.8**	**0.0**	**1.4**	**2.1**	**7.7**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 1
Residuals = 1 with a transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Scenario : country-specific residuals

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.0	1.3	1.9	0.3	1.5	-0.8	0.0	2.0	3.0	8.5
Austria	3.8	3.8	0.1	0.6	-0.4	0.0	0.0	0.3	0.2	1.3	-0.9	0.0	0.0	0.6	4.4
Belgium	4.9	5.7	0.1	0.5	-0.5	0.0	0.6	0.6	0.1	0.9	-1.0	0.0	0.9	0.9	6.7
Canada	5.3	6.2	0.1	0.8	-0.3	0.0	0.6	1.2	0.2	1.3	-0.7	0.0	0.8	1.7	7.8
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.0	-0.4	0.1	0.2	1.6	-0.9	0.0	-0.5	0.4	7.5
Denmark	4.6	5.3	0.1	0.5	-0.4	0.0	-0.4	-0.2	0.1	0.8	-0.6	0.0	-0.5	-0.2	5.1
Finland	2.7	3.4	0.1	0.8	-0.4	0.0	0.2	0.7	0.2	1.1	-0.9	0.0	0.3	0.7	4.1
France	6.2	7.0	0.1	0.6	-0.5	0.0	0.9	1.1	0.2	1.2	-1.1	0.0	1.4	1.7	8.7
Germany	7.4	7.8	0.1	0.6	-0.4	0.0	0.9	1.2	0.2	1.0	-0.8	0.0	1.4	1.8	9.6
Greece	5.0	4.9	0.1	0.5	-0.3	0.0	0.7	1.0	0.2	1.0	-0.6	0.0	1.1	1.7	6.6
Hungary	4.8	6.7	0.1	0.7	-0.6	0.0	-1.2	-0.9	0.2	1.4	-1.2	0.0	-1.6	-1.3	5.4
Iceland	5.4	6.8	0.1	0.6	-0.3	0.0	2.0	2.4	0.2	1.0	-0.4	0.0	3.0	3.8	10.5
Ireland	4.2	5.9	0.1	0.5	-0.2	0.0	-0.8	-0.4	0.2	1.3	-0.7	0.0	-1.1	-0.3	5.6
Italy	5.3	6.0	0.1	0.7	-0.5	0.0	-0.1	0.3	0.2	1.6	-1.3	0.0	-0.1	0.5	6.4
Japan	5.3	6.0	0.1	0.8	-0.3	0.0	1.1	1.8	0.2	1.4	-0.5	0.0	1.6	2.7	8.7
Korea	2.0	3.0	0.2	1.3	-0.6	0.0	2.6	3.4	0.3	2.6	-1.3	0.0	4.0	5.6	8.6
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.0	-0.1	0.0	0.2	0.9	-0.6	0.0	-0.1	0.4	6.6
Mexico	2.5	3.0	0.1	0.7	-0.3	0.0	2.6	3.0	0.2	2.0	-0.9	0.0	4.0	5.3	8.3
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.0	0.3	0.7	0.1	0.8	-0.4	0.0	0.4	1.0	6.1
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.0	1.0	1.5	0.2	1.5	-0.8	0.0	1.5	2.4	8.4
Norway	5.2	7.3	0.1	0.5	-0.4	0.0	1.4	1.6	0.2	0.9	-0.8	0.0	2.1	2.4	9.6
Poland	3.6	4.4	0.1	1.0	-0.6	0.0	-0.5	0.1	0.2	2.1	-1.5	0.0	-0.7	0.2	4.6
Portugal	6.2	6.7	0.1	0.6	-0.4	0.0	3.0	3.4	0.2	1.5	-0.8	0.0	4.8	5.8	12.6
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.0	-1.2	-0.6	0.3	2.2	-1.1	0.0	-1.6	-0.2	4.9
Spain	5.1	5.5	0.1	0.5	-0.3	0.0	0.7	1.1	0.2	1.3	-0.6	0.0	1.1	2.0	7.5
Sweden	4.5	5.3	0.1	0.4	-0.3	0.0	-0.3	-0.2	0.1	0.5	-0.6	0.0	-0.5	-0.4	4.9
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.0	3.1	3.4	0.1	0.8	-0.6	0.0	4.9	5.2	11.4
Turkey	4.1	5.9	0.1	0.6	-0.4	0.0	14.4	14.7	0.3	1.7	-1.1	0.0	29.1	30.0	35.8
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.0	0.9	1.1	0.2	1.0	-0.8	0.0	1.4	1.7	7.9
United States	5.1	6.3	0.1	0.6	-0.4	0.0	2.7	3.0	0.1	0.8	-0.7	0.0	4.3	4.5	10.8
Average [1]	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.0**	**0.8**	**1.1**	**0.2**	**1.3**	**-0.8**	**0.0**	**1.2**	**1.8**	**7.5**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 1
Country specific residuals with a transversality condition
1. Excluding Turkey.
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Sensitivity analysis: income elasticity at 0.8

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	-0.5	0.9	1.0	0.3	1.5	-0.8	-0.8	1.4	1.5	7.1
Austria	3.8	3.8	0.1	0.6	-0.4	-0.4	0.9	0.9	0.2	1.3	-0.9	-0.7	1.4	1.2	5.0
Belgium	4.9	5.7	0.1	0.5	-0.5	-0.4	0.9	0.6	0.1	0.9	-1.0	-0.8	1.4	0.7	6.4
Canada	5.3	6.2	0.1	0.8	-0.3	-0.4	0.9	1.2	0.2	1.3	-0.7	-0.8	1.4	1.4	7.6
Czech Republic	5.7	7.0	0.1	0.7	-0.4	-0.2	0.9	1.1	0.2	1.6	-0.9	-0.5	1.4	1.8	8.9
Denmark	4.6	5.3	0.1	0.5	-0.4	-0.4	0.9	0.8	0.1	0.8	-0.6	-0.8	1.4	0.9	6.2
Finland	2.7	3.4	0.1	0.8	-0.4	-0.5	0.9	1.0	0.2	1.1	-0.9	-0.9	1.4	0.9	4.3
France	6.2	7.0	0.1	0.6	-0.5	-0.3	0.9	0.9	0.2	1.2	-1.1	-0.7	1.4	1.0	8.1
Germany	7.4	7.8	0.1	0.6	-0.4	-0.3	0.9	0.9	0.2	1.0	-0.8	-0.6	1.4	1.1	8.9
Greece	5.0	4.9	0.1	0.5	-0.3	-0.5	0.9	0.8	0.2	1.0	-0.6	-0.8	1.4	1.2	6.1
Hungary	4.8	6.7	0.1	0.7	-0.6	-0.5	0.9	0.7	0.2	1.4	-1.2	-0.9	1.4	0.8	7.5
Iceland	5.4	6.8	0.1	0.6	-0.3	-0.6	0.9	0.8	0.2	1.0	-0.4	-1.0	1.4	1.2	7.9
Ireland	4.2	5.9	0.1	0.5	-0.2	-0.9	0.9	0.4	0.2	1.3	-0.7	-1.3	1.4	1.0	6.9
Italy	5.3	6.0	0.1	0.7	-0.5	-0.3	0.9	1.0	0.2	1.6	-1.3	-0.6	1.4	1.3	7.3
Japan	5.3	6.0	0.1	0.8	-0.3	-0.2	0.9	1.4	0.2	1.4	-0.5	-0.6	1.4	1.9	7.9
Korea	2.0	3.0	0.2	1.3	-0.6	-0.4	0.9	1.4	0.3	2.6	-1.3	-0.8	1.4	2.3	5.3
Luxembourg	4.9	6.1	0.1	0.4	-0.4	-0.7	0.9	0.3	0.2	0.9	-0.6	-1.1	1.4	0.8	6.9
Mexico	2.5	3.0	0.1	0.7	-0.3	-0.7	0.9	0.7	0.2	2.0	-0.9	-1.3	1.4	1.4	4.4
Netherlands	3.9	5.1	0.1	0.6	-0.3	-0.4	0.9	1.0	0.1	0.8	-0.4	-0.8	1.4	1.2	6.3
New Zealand	5.7	6.0	0.1	0.8	-0.4	-0.3	0.9	1.2	0.2	1.5	-0.8	-0.7	1.4	1.6	7.6
Norway	5.2	7.3	0.1	0.5	-0.4	-0.4	0.9	0.7	0.2	0.9	-0.8	-0.8	1.4	0.8	8.1
Poland	3.6	4.4	0.1	1.0	-0.6	-0.8	0.9	0.8	0.2	2.1	-1.5	-1.2	1.4	1.1	5.5
Portugal	6.2	6.7	0.1	0.6	-0.4	-0.5	0.9	0.8	0.2	1.5	-0.8	-0.8	1.4	1.6	8.3
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	-0.4	0.9	1.1	0.3	2.2	-1.1	-0.7	1.4	2.1	7.2
Spain	5.1	5.5	0.1	0.5	-0.3	-0.3	0.9	1.0	0.2	1.3	-0.6	-0.6	1.4	1.7	7.1
Sweden	4.5	5.3	0.1	0.4	-0.3	-0.4	0.9	0.7	0.1	0.5	-0.6	-0.9	1.4	0.5	5.9
Switzerland	4.9	6.2	0.1	0.5	-0.3	-0.3	0.9	0.9	0.1	0.8	-0.6	-0.7	1.4	0.9	7.1
Turkey	4.1	5.9	0.1	0.6	-0.4	-0.5	0.9	0.8	0.3	1.7	-1.1	-0.8	1.4	1.4	7.3
United Kingdom	5.0	6.1	0.1	0.6	-0.5	-0.4	0.9	0.7	0.2	1.0	-0.8	-0.8	1.4	0.9	7.1
United States	5.1	6.3	0.1	0.6	-0.4	-0.4	0.9	0.8	0.1	0.8	-0.7	-0.8	1.4	0.8	7.1
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**-0.4**	**0.9**	**0.9**	**0.2**	**1.3**	**-0.8**	**-0.8**	**1.4**	**1.2**	**6.9**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 0.8
Residuals = 1 with a transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Sensitivity analysis: income elasticity 1.2

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.5	0.9	2.0	0.3	1.5	-0.8	1.0	1.4	3.3	8.9
Austria	3.8	3.8	0.1	0.6	-0.4	0.4	0.9	1.6	0.2	1.3	-0.9	0.8	1.4	2.8	6.6
Belgium	4.9	5.7	0.1	0.5	-0.5	0.4	0.9	1.4	0.1	0.9	-1.0	0.9	1.4	2.4	8.1
Canada	5.3	6.2	0.1	0.8	-0.3	0.4	0.9	2.0	0.2	1.3	-0.7	0.9	1.4	3.2	9.3
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.3	0.9	1.6	0.2	1.6	-0.9	0.5	1.4	2.8	9.9
Denmark	4.6	5.3	0.1	0.5	-0.4	0.4	0.9	1.5	0.1	0.8	-0.6	0.9	1.4	2.6	7.9
Finland	2.7	3.4	0.1	0.8	-0.4	0.5	0.9	2.0	0.2	1.1	-0.9	1.1	1.4	2.9	6.3
France	6.2	7.0	0.1	0.6	-0.5	0.3	0.9	1.4	0.2	1.2	-1.1	0.7	1.4	2.4	9.5
Germany	7.4	7.8	0.1	0.6	-0.4	0.3	0.9	1.5	0.2	1.0	-0.8	0.7	1.4	2.5	10.3
Greece	5.0	4.9	0.1	0.5	-0.3	0.6	0.9	1.8	0.2	1.0	-0.6	1.0	1.4	3.0	7.9
Hungary	4.8	6.7	0.1	0.7	-0.6	0.6	0.9	1.8	0.2	1.4	-1.2	1.1	1.4	2.9	9.6
Iceland	5.4	6.8	0.1	0.6	-0.3	0.7	0.9	2.0	0.2	1.0	-0.4	1.2	1.4	3.3	10.1
Ireland	4.2	5.9	0.1	0.5	-0.2	1.1	0.9	2.4	0.2	1.3	-0.7	1.6	1.4	3.9	9.8
Italy	5.3	6.0	0.1	0.7	-0.5	0.3	0.9	1.6	0.2	1.6	-1.3	0.7	1.4	2.6	8.6
Japan	5.3	6.0	0.1	0.8	-0.3	0.2	0.9	1.9	0.2	1.4	-0.5	0.7	1.4	3.1	9.1
Korea	2.0	3.0	0.2	1.3	-0.6	0.5	0.9	2.3	0.3	2.6	-1.3	0.9	1.4	3.9	6.9
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.9	0.9	1.9	0.2	0.9	-0.6	1.4	1.4	3.3	9.4
Mexico	2.5	3.0	0.1	0.7	-0.3	0.9	0.9	2.3	0.2	2.0	-0.9	1.6	1.4	4.3	7.3
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.4	0.9	1.8	0.1	0.8	-0.4	0.9	1.4	2.9	8.0
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.3	0.9	1.8	0.2	1.5	-0.8	0.8	1.4	3.1	9.1
Norway	5.2	7.3	0.1	0.5	-0.4	0.4	0.9	1.5	0.2	0.9	-0.8	0.9	1.4	2.6	9.8
Poland	3.6	4.4	0.1	1.0	-0.6	0.9	0.9	2.4	0.2	2.1	-1.5	1.5	1.4	3.8	8.2
Portugal	6.2	6.7	0.1	0.6	-0.4	0.5	0.9	1.8	0.2	1.5	-0.8	0.9	1.4	3.3	10.1
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.4	0.9	2.0	0.3	2.2	-1.1	0.7	1.4	3.5	8.6
Spain	5.1	5.5	0.1	0.5	-0.3	0.3	0.9	1.6	0.2	1.3	-0.6	0.7	1.4	3.0	8.5
Sweden	4.5	5.3	0.1	0.4	-0.3	0.5	0.9	1.6	0.1	0.5	-0.6	1.0	1.4	2.4	7.7
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.3	0.9	1.6	0.1	0.8	-0.6	0.8	1.4	2.5	8.6
Turkey	4.1	5.9	0.1	0.6	-0.4	0.5	0.9	1.8	0.3	1.7	-1.1	1.0	1.4	3.2	9.1
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.4	0.9	1.6	0.2	1.0	-0.8	1.0	1.4	2.7	8.8
United States	5.1	6.3	0.1	0.6	-0.4	0.4	0.9	1.7	0.1	0.8	-0.7	1.0	1.4	2.6	8.9
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.5**	**0.9**	**1.8**	**0.2**	**1.3**	**-0.8**	**1.0**	**1.4**	**3.0**	**8.7**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 1.2
Residuals = 1 with a transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Sensitivity analysis: residual at 1.5% per year

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.4	0.0	1.5	2.0	0.3	1.5	-0.8	0.0	2.2	3.2	8.7
Austria	3.8	3.8	0.1	0.6	-0.4	0.0	1.5	1.8	0.2	1.3	-0.9	0.0	2.2	2.8	6.6
Belgium	4.9	5.7	0.1	0.5	-0.5	0.0	1.5	1.5	0.1	0.9	-1.0	0.0	2.2	2.3	8.0
Canada	5.3	6.2	0.1	0.8	-0.3	0.0	1.5	2.1	0.2	1.3	-0.7	0.0	2.2	3.1	9.2
Czech Republic	5.7	7.0	0.1	0.7	-0.4	0.0	1.5	1.9	0.2	1.6	-0.9	0.0	2.2	3.1	10.2
Denmark	4.6	5.3	0.1	0.5	-0.4	0.0	1.5	1.7	0.1	0.8	-0.6	0.0	2.2	2.5	7.8
Finland	2.7	3.4	0.1	0.8	-0.4	0.0	1.5	2.0	0.2	1.1	-0.9	0.0	2.2	2.6	6.0
France	6.2	7.0	0.1	0.6	-0.5	0.0	1.5	1.7	0.2	1.2	-1.1	0.0	2.2	2.5	9.6
Germany	7.4	7.8	0.1	0.6	-0.4	0.0	1.5	1.7	0.2	1.0	-0.8	0.0	2.2	2.6	10.4
Greece	5.0	4.9	0.1	0.5	-0.3	0.0	1.5	1.8	0.2	1.0	-0.6	0.0	2.2	2.9	7.7
Hungary	4.8	6.7	0.1	0.7	-0.6	0.0	1.5	1.8	0.2	1.4	-1.2	0.0	2.2	2.6	9.3
Iceland	5.4	6.8	0.1	0.6	-0.3	0.0	1.5	1.9	0.2	1.0	-0.4	0.0	2.2	3.0	9.7
Ireland	4.2	5.9	0.1	0.5	-0.2	0.0	1.5	1.8	0.2	1.3	-0.7	0.0	2.2	3.0	9.0
Italy	5.3	6.0	0.1	0.7	-0.5	0.0	1.5	1.8	0.2	1.6	-1.3	0.0	2.2	2.7	8.7
Japan	5.3	6.0	0.1	0.8	-0.3	0.0	1.5	2.2	0.2	1.4	-0.5	0.0	2.2	3.3	9.3
Korea	2.0	3.0	0.2	1.3	-0.6	0.0	1.5	2.3	0.3	2.6	-1.3	0.0	2.2	3.8	6.8
Luxembourg	4.9	6.1	0.1	0.4	-0.4	0.0	1.5	1.6	0.2	0.9	-0.6	0.0	2.2	2.7	8.9
Mexico	2.5	3.0	0.1	0.7	-0.3	0.0	1.5	1.9	0.2	2.0	-0.9	0.0	2.2	3.5	6.5
Netherlands	3.9	5.1	0.1	0.6	-0.3	0.0	1.5	1.9	0.1	0.8	-0.4	0.0	2.2	2.8	7.9
New Zealand	5.7	6.0	0.1	0.8	-0.4	0.0	1.5	2.0	0.2	1.5	-0.8	0.0	2.2	3.2	9.1
Norway	5.2	7.3	0.1	0.5	-0.4	0.0	1.5	1.6	0.2	0.9	-0.8	0.0	2.2	2.4	9.7
Poland	3.6	4.4	0.1	1.0	-0.6	0.0	1.5	2.1	0.2	2.1	-1.5	0.0	2.2	3.1	7.5
Portugal	6.2	6.7	0.1	0.6	-0.4	0.0	1.5	1.8	0.2	1.5	-0.8	0.0	2.2	3.2	9.9
Slovak Republic	4.6	5.1	0.1	1.0	-0.6	0.0	1.5	2.1	0.3	2.2	-1.1	0.0	2.2	3.6	8.7
Spain	5.1	5.5	0.1	0.5	-0.3	0.0	1.5	1.8	0.2	1.3	-0.6	0.0	2.2	3.1	8.6
Sweden	4.5	5.3	0.1	0.4	-0.3	0.0	1.5	1.6	0.1	0.5	-0.6	0.0	2.2	2.2	7.5
Switzerland	4.9	6.2	0.1	0.5	-0.3	0.0	1.5	1.8	0.1	0.8	-0.6	0.0	2.2	2.5	8.6
Turkey	4.1	5.9	0.1	0.6	-0.4	0.0	1.5	1.8	0.3	1.7	-1.1	0.0	2.2	3.1	8.9
United Kingdom	5.0	6.1	0.1	0.6	-0.5	0.0	1.5	1.6	0.2	1.0	-0.8	0.0	2.2	2.6	8.7
United States	5.1	6.3	0.1	0.6	-0.4	0.0	1.5	1.8	0.1	0.8	-0.7	0.0	2.2	2.4	8.7
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.4**	**0.0**	**1.5**	**1.8**	**0.2**	**1.3**	**-0.8**	**0.0**	**2.2**	**2.9**	**8.5**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1 year in good health)
Income elasticity = 1
Residuals = 1.5 with a transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Sensitivity analysis: Compression of morbidity scenario

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	-0.6	0.0	0.9	1.2	0.3	1.5	-1.6	0.0	1.4	1.6	7.1
Austria	3.8	3.8	0.1	0.6	-0.8	0.0	0.9	0.9	0.2	1.3	-1.7	0.0	1.4	1.2	5.0
Belgium	4.9	5.7	0.1	0.5	-0.8	0.0	0.9	0.6	0.1	0.9	-1.7	0.0	1.4	0.7	6.4
Canada	5.3	6.2	0.1	0.8	-0.5	0.0	0.9	1.3	0.2	1.3	-1.2	0.0	1.4	1.7	7.9
Czech Republic	5.7	7.0	0.1	0.7	-0.8	0.0	0.9	1.0	0.2	1.6	-1.7	0.0	1.4	1.5	8.5
Denmark	4.6	5.3	0.1	0.5	-0.6	0.0	0.9	0.9	0.1	0.8	-1.1	0.0	1.4	1.2	6.4
Finland	2.7	3.4	0.1	0.8	-0.8	0.0	0.9	1.1	0.2	1.1	-1.7	0.0	1.4	1.0	4.4
France	6.2	7.0	0.1	0.6	-1.0	0.0	0.9	0.7	0.2	1.2	-2.0	0.0	1.4	0.8	7.8
Germany	7.4	7.8	0.1	0.6	-0.6	0.0	0.9	0.9	0.2	1.0	-1.4	0.0	1.4	1.2	9.0
Greece	5.0	4.9	0.1	0.5	-0.5	0.0	0.9	1.0	0.2	1.0	-1.1	0.0	1.4	1.5	6.4
Hungary	4.8	6.7	0.1	0.7	-0.9	0.0	0.9	0.9	0.2	1.4	-2.0	0.0	1.4	0.9	7.6
Iceland	5.4	6.8	0.1	0.6	-0.4	0.0	0.9	1.2	0.2	1.0	-0.7	0.0	1.4	1.8	8.5
Ireland	4.2	5.9	0.1	0.5	-0.5	0.0	0.9	1.1	0.2	1.3	-1.2	0.0	1.4	1.7	7.7
Italy	5.3	6.0	0.1	0.7	-1.0	0.0	0.9	0.8	0.2	1.6	-2.3	0.0	1.4	0.9	6.8
Japan	5.3	6.0	0.1	0.8	-0.5	0.0	0.9	1.4	0.2	1.4	-1.0	0.0	1.4	1.9	7.9
Korea	2.0	3.0	0.2	1.3	-1.0	0.0	0.9	1.4	0.3	2.6	-2.5	0.0	1.4	1.8	4.8
Luxembourg	4.9	6.1	0.1	0.4	-0.6	0.0	0.9	0.8	0.2	0.9	-1.2	0.0	1.4	1.3	7.5
Mexico	2.5	3.0	0.1	0.7	-0.5	0.0	0.9	1.2	0.2	2.0	-1.6	0.0	1.4	1.9	4.9
Netherlands	3.9	5.1	0.1	0.6	-0.4	0.0	0.9	1.3	0.1	0.8	-0.6	0.0	1.4	1.7	6.8
New Zealand	5.7	6.0	0.1	0.8	-0.6	0.0	0.9	1.2	0.2	1.5	-1.4	0.0	1.4	1.7	7.7
Norway	5.2	7.3	0.1	0.5	-0.7	0.0	0.9	0.8	0.2	0.9	-1.6	0.0	1.4	0.9	8.1
Poland	3.6	4.4	0.1	1.0	-1.1	0.0	0.9	1.0	0.2	2.1	-2.7	0.0	1.4	1.1	5.5
Portugal	6.2	6.7	0.1	0.6	-0.7	0.0	0.9	1.0	0.2	1.5	-1.5	0.0	1.4	1.7	8.4
Slovak Republic	4.6	5.1	0.1	1.0	-1.0	0.0	0.9	1.2	0.3	2.2	-2.2	0.0	1.4	1.7	6.8
Spain	5.1	5.5	0.1	0.5	-0.5	0.0	0.9	1.0	0.2	1.3	-1.1	0.0	1.4	1.8	7.2
Sweden	4.5	5.3	0.1	0.4	-0.5	0.0	0.9	0.9	0.1	0.5	-1.0	0.0	1.4	1.0	6.3
Switzerland	4.9	6.2	0.1	0.5	-0.5	0.0	0.9	1.0	0.1	0.8	-1.1	0.0	1.4	1.2	7.4
Turkey	4.1	5.9	0.1	0.6	-0.7	0.0	0.9	1.0	0.3	1.7	-1.9	0.0	1.4	1.5	7.3
United Kingdom	5.0	6.1	0.1	0.6	-0.8	0.0	0.9	0.8	0.2	1.0	-1.6	0.0	1.4	1.0	7.1
United States	5.1	6.3	0.1	0.6	-0.7	0.0	0.9	0.9	0.1	0.8	-1.3	0.0	1.4	1.0	7.3
Average	**4.8**	**5.7**	**0.1**	**0.7**	**-0.7**	**0.0**	**0.9**	**1.0**	**0.2**	**1.3**	**-1.5**	**0.0**	**1.4**	**1.4**	**7.0**

NB: Assumptions used in this scenario:
Healthy ageing : 1 year gains in life expectancy = 2 years in good health
Income elasticity = 1
Residuals = 1 with a transversality condition
Source : Secretariat calculations.

Table A2.3 (cont.) Breakdown of the projections of public health care expenditure for each driver

Sensitivity analysis: Expansion of morbidity scenario

	Health expenditure as a % of GDP		Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Death-related costs	Pure age effect (survivors)	Adjustment for healthy ageing	Income effect	Non-ageing residual effect	Total	Health expenditure as a % of GDP
	2000	2005	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						2050
Australia	5.3	5.6	0.1	0.8	0.0	0.0	0.9	1.9	0.3	1.5	0.0	0.0	1.4	3.1	8.7
Austria	3.8	3.8	0.1	0.6	0.0	0.0	0.9	1.6	0.2	1.3	0.0	0.0	1.4	2.9	6.7
Belgium	4.9	5.7	0.1	0.5	0.0	0.0	0.9	1.5	0.1	0.9	0.0	0.0	1.4	2.4	8.2
Canada	5.3	6.2	0.1	0.8	0.0	0.0	0.9	1.9	0.2	1.3	0.0	0.0	1.4	2.9	9.1
Czech Republic	5.7	7.0	0.1	0.7	0.0	0.0	0.9	1.8	0.2	1.6	0.0	0.0	1.4	3.2	10.3
Denmark	4.6	5.3	0.1	0.5	0.0	0.0	0.9	1.5	0.1	0.8	0.0	0.0	1.4	2.3	7.6
Finland	2.7	3.4	0.1	0.8	0.0	0.0	0.9	1.9	0.2	1.1	0.0	0.0	1.4	2.7	6.1
France	6.2	7.0	0.1	0.6	0.0	0.0	0.9	1.6	0.2	1.2	0.0	0.0	1.4	2.8	9.8
Germany	7.4	7.8	0.1	0.6	0.0	0.0	0.9	1.6	0.2	1.0	0.0	0.0	1.4	2.6	10.4
Greece	5.0	4.9	0.1	0.5	0.0	0.0	0.9	1.5	0.2	1.0	0.0	0.0	1.4	2.6	7.5
Hungary	4.8	6.7	0.1	0.7	0.0	0.0	0.9	1.8	0.2	1.4	0.0	0.0	1.4	2.9	9.6
Iceland	5.4	6.8	0.1	0.6	0.0	0.0	0.9	1.6	0.2	1.0	0.0	0.0	1.4	2.5	9.3
Ireland	4.2	5.9	0.1	0.5	0.0	0.0	0.9	1.6	0.2	1.3	0.0	0.0	1.4	2.9	8.8
Italy	5.3	6.0	0.1	0.7	0.0	0.0	0.9	1.8	0.2	1.6	0.0	0.0	1.4	3.2	9.2
Japan	5.3	6.0	0.1	0.8	0.0	0.0	0.9	1.9	0.2	1.4	0.0	0.0	1.4	3.0	9.0
Korea	2.0	3.0	0.2	1.3	0.0	0.0	0.9	2.4	0.3	2.6	0.0	0.0	1.4	4.3	7.3
Luxembourg	4.9	6.1	0.1	0.4	0.0	0.0	0.9	1.4	0.2	0.9	0.0	0.0	1.4	2.5	8.6
Mexico	2.5	3.0	0.1	0.7	0.0	0.0	0.9	1.7	0.2	2.0	0.0	0.0	1.4	3.5	6.5
Netherlands	3.9	5.1	0.1	0.6	0.0	0.0	0.9	1.7	0.1	0.8	0.0	0.0	1.4	2.4	7.4
New Zealand	5.7	6.0	0.1	0.8	0.0	0.0	0.9	1.9	0.2	1.5	0.0	0.0	1.4	3.1	9.1
Norway	5.2	7.3	0.1	0.5	0.0	0.0	0.9	1.5	0.2	0.9	0.0	0.0	1.4	2.4	9.7
Poland	3.6	4.4	0.1	1.0	0.0	0.0	0.9	2.1	0.2	2.1	0.0	0.0	1.4	3.8	8.2
Portugal	6.2	6.7	0.1	0.6	0.0	0.0	0.9	1.7	0.2	1.5	0.0	0.0	1.4	3.2	9.9
Slovak Republic	4.6	5.1	0.1	1.0	0.0	0.0	0.9	2.1	0.3	2.2	0.0	0.0	1.4	3.9	9.0
Spain	5.1	5.5	0.1	0.5	0.0	0.0	0.9	1.6	0.2	1.3	0.0	0.0	1.4	2.9	8.3
Sweden	4.5	5.3	0.1	0.4	0.0	0.0	0.9	1.4	0.1	0.5	0.0	0.0	1.4	2.0	7.3
Switzerland	4.9	6.2	0.1	0.5	0.0	0.0	0.9	1.5	0.1	0.8	0.0	0.0	1.4	2.3	8.4
Turkey	4.1	5.9	0.1	0.6	0.0	0.0	0.9	1.7	0.3	1.7	0.0	0.0	1.4	3.4	9.2
United Kingdom	5.0	6.1	0.1	0.6	0.0	0.0	0.9	1.6	0.2	1.0	0.0	0.0	1.4	2.6	8.7
United States	5.1	6.3	0.1	0.6	0.0	0.0	0.9	1.6	0.1	0.8	0.0	0.0	1.4	2.3	8.6
Average	**4.8**	**5.7**	**0.1**	**0.7**	**0.0**	**0.0**	**0.9**	**1.7**	**0.2**	**1.3**	**0.0**	**0.0**	**1.4**	**2.9**	**8.5**

NB: Assumptions used in this scenario:
Expansion of morbidity : gains in life expectancy do not translate into years in good health
Income elasticity = 1
Residuals = 1 with a transversality condition
Source : Secretariat calculations.

Table A2.4 Breakdown of the projections of long-term care expenditure for each driver

Demographic effect

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.1	-0.4	0.3	0.0	0.4	1.8	-0.5	-0.6	0.6	0.0	1.3	*2.2*
Austria	*1.3*	*1.3*	0.5	-0.1	-0.3	0.2	0.0	0.3	1.6	-0.5	-0.5	0.6	0.0	1.2	*2.5*
Belgium	*1.3*	*1.5*	0.4	-0.1	-0.3	0.2	0.0	0.2	1.3	-0.4	-0.5	0.5	0.0	0.9	*2.4*
Canada	*1.0*	*1.2*	0.6	-0.1	-0.3	0.2	0.0	0.4	1.6	-0.4	-0.6	0.6	0.0	1.1	*2.3*
Czech Republic	*0.3*	*0.4*	0.6	-0.1	-0.2	0.2	0.0	0.5	2.1	-0.5	-0.4	0.5	0.0	1.6	*2.0*
Denmark	*2.3*	*2.6*	0.3	-0.1	-0.3	0.2	0.0	0.1	1.1	-0.4	-0.6	0.5	0.0	0.7	*3.3*
Finland	*2.3*	*2.9*	0.8	-0.1	-0.4	0.3	0.0	0.6	1.9	-0.5	-0.6	0.6	0.0	1.4	*4.3*
France	*1.0*	*1.1*	0.5	-0.1	-0.2	0.2	0.0	0.4	1.7	-0.5	-0.5	0.5	0.0	1.2	*2.3*
Germany	*1.0*	*1.0*	0.6	-0.1	-0.2	0.2	0.0	0.4	1.3	-0.4	-0.5	0.5	0.0	0.9	*1.9*
Greece	*0.2*	*0.2*	0.6	-0.1	-0.4	0.2	0.0	0.3	1.3	-0.4	-0.6	0.5	0.0	0.8	*1.0*
Hungary	*0.2*	*0.3*	0.7	-0.1	-0.4	0.4	0.0	0.5	1.6	-0.5	-0.6	0.8	0.0	1.3	*1.5*
Iceland	*2.3*	*2.9*	0.3	-0.1	-0.4	0.3	0.0	0.0	1.0	-0.3	-0.7	0.6	0.0	0.6	*3.5*
Ireland	*0.5*	*0.7*	0.3	-0.1	-0.6	0.4	0.0	0.1	1.3	-0.4	-0.8	0.8	0.0	1.0	*1.7*
Italy	*0.6*	*0.6*	0.7	-0.1	-0.2	0.2	0.0	0.5	1.8	-0.5	-0.5	0.5	0.0	1.3	*2.0*
Japan	*0.8*	*0.9*	1.0	-0.2	-0.2	0.2	0.0	0.8	2.0	-0.5	-0.5	0.5	0.0	1.5	*2.3*
Korea	*0.2*	*0.3*	1.4	-0.2	-0.3	0.3	0.0	1.2	4.7	-1.0	-0.5	0.6	0.0	3.8	*4.1*
Luxembourg	*0.5*	*0.7*	0.4	-0.1	-0.5	0.4	0.0	0.2	1.4	-0.4	-0.7	0.7	0.0	1.0	*1.6*
Mexico	*0.1*	*0.1*	0.7	-0.1	-0.5	0.3	0.0	0.3	2.6	-0.6	-0.8	0.7	0.0	1.9	*2.0*
Netherlands	*1.3*	*1.7*	0.5	-0.1	-0.3	0.2	0.0	0.3	1.1	-0.4	-0.6	0.5	0.0	0.7	*2.4*
New Zealand	*0.5*	*0.5*	0.7	-0.1	-0.3	0.2	0.0	0.5	2.1	-0.5	-0.5	0.5	0.0	1.6	*2.0*
Norway	*1.9*	*2.6*	0.2	-0.1	-0.3	0.2	0.0	0.0	1.1	-0.4	-0.6	0.5	0.0	0.7	*3.3*
Poland	*0.4*	*0.5*	0.8	-0.1	-0.5	0.5	0.0	0.6	2.5	-0.6	-0.7	1.0	0.0	2.1	*2.6*
Portugal	*0.2*	*0.2*	0.6	-0.1	-0.4	0.3	0.0	0.3	1.6	-0.5	-0.6	0.6	0.0	1.1	*1.3*
Slovak Republic	*0.3*	*0.3*	0.8	-0.1	-0.3	0.3	0.0	0.6	2.8	-0.7	-0.5	0.7	0.0	2.3	*2.6*
Spain	*0.2*	*0.2*	0.4	-0.1	-0.3	0.2	0.0	0.3	1.3	-0.4	-0.5	0.5	0.0	0.9	*1.0*
Sweden	*2.7*	*3.3*	0.2	-0.1	-0.3	0.3	0.0	0.1	0.6	-0.3	-0.6	0.6	0.0	0.3	*3.6*
Switzerland	*1.0*	*1.2*	0.3	-0.1	-0.3	0.2	0.0	0.1	0.9	-0.3	-0.5	0.5	0.0	0.5	*1.7*
Turkey	*0.1*	*0.1*	0.6	-0.1	-0.4	0.3	0.0	0.4	2.2	-0.6	-0.6	0.6	0.0	1.7	*1.8*
United Kingdom	*0.9*	*1.1*	0.5	-0.1	-0.3	0.2	0.0	0.3	1.5	-0.4	-0.6	0.6	0.0	1.0	*2.1*
United States	*0.7*	*0.9*	0.4	-0.1	-0.3	0.2	0.0	0.2	1.3	-0.4	-0.6	0.6	0.0	0.9	*1.8*
Average	**0.9**	**1.1**	**0.6**	**-0.1**	**-0.3**	**0.3**	**0.0**	**0.4**	**1.7**	**-0.5**	**-0.6**	**0.6**	**0.0**	**1.2**	**2.3**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health); zero income elasticity; half Baumol effect
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source : Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Cost-pressure scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.1	-0.4	0.6	-0.1	0.5	1.8	-0.5	-0.6	1.5	-0.2	2.0	*2.9*
Austria	*1.3*	*1.3*	0.5	-0.1	-0.3	0.5	0.0	0.6	1.6	-0.5	-0.5	1.4	0.0	2.0	*3.3*
Belgium	*1.3*	*1.5*	0.4	-0.1	-0.3	0.5	0.1	0.6	1.3	-0.4	-0.5	1.3	0.2	1.9	*3.4*
Canada	*1.0*	*1.2*	0.6	-0.1	-0.3	0.5	0.0	0.6	1.6	-0.4	-0.6	1.4	0.1	2.1	*3.2*
Czech Republic	*0.3*	*0.4*	0.6	-0.1	-0.2	0.4	0.0	0.7	2.1	-0.5	-0.4	1.1	-0.6	1.7	*2.0*
Denmark	*2.3*	*2.6*	0.3	-0.1	-0.3	0.5	-0.1	0.4	1.1	-0.4	-0.6	1.4	0.0	1.5	*4.1*
Finland	*2.3*	*2.9*	0.8	-0.1	-0.4	0.7	-0.2	0.8	1.9	-0.5	-0.6	1.7	-0.1	2.4	*5.2*
France	*1.0*	*1.1*	0.5	-0.1	-0.2	0.4	-0.2	0.4	1.7	-0.5	-0.5	1.3	-0.3	1.7	*2.8*
Germany	*1.0*	*1.0*	0.6	-0.1	-0.2	0.4	0.2	0.8	1.3	-0.4	-0.5	1.1	0.3	1.9	*2.9*
Greece	*0.2*	*0.2*	0.6	-0.1	-0.4	0.5	0.7	1.3	1.3	-0.4	-0.6	1.4	1.0	2.7	*2.8*
Hungary	*0.2*	*0.3*	0.7	-0.1	-0.4	0.8	-0.1	0.8	1.6	-0.5	-0.6	2.1	-0.5	2.1	*2.4*
Iceland	*2.3*	*2.9*	0.3	-0.1	-0.4	0.7	-0.1	0.3	1.0	-0.3	-0.7	1.6	-0.1	1.6	*4.4*
Ireland	*0.5*	*0.7*	0.3	-0.1	-0.6	1.0	0.8	1.5	1.3	-0.4	-0.8	2.2	1.5	3.8	*4.6*
Italy	*0.6*	*0.6*	0.7	-0.1	-0.2	0.4	0.6	1.3	1.8	-0.5	-0.5	1.1	0.9	2.9	*3.5*
Japan	*0.8*	*0.9*	1.0	-0.2	-0.2	0.4	0.1	1.1	2.0	-0.5	-0.5	1.1	0.0	2.2	*3.1*
Korea	*0.2*	*0.3*	1.4	-0.2	-0.3	0.6	-0.5	1.1	4.7	-1.0	-0.5	1.6	-1.0	3.8	*4.1*
Luxembourg	*0.5*	*0.7*	0.4	-0.1	-0.5	0.9	0.6	1.3	1.4	-0.4	-0.7	2.0	0.9	3.1	*3.8*
Mexico	*0.1*	*0.1*	0.7	-0.1	-0.5	0.7	0.5	1.2	2.6	-0.6	-0.8	1.9	1.0	4.1	*4.2*
Netherlands	*1.3*	*1.7*	0.5	-0.1	-0.3	0.5	0.2	0.7	1.1	-0.4	-0.6	1.3	0.5	2.0	*3.7*
New Zealand	*0.5*	*0.5*	0.7	-0.1	-0.3	0.4	-0.1	0.6	2.1	-0.5	-0.5	1.3	-0.4	2.0	*2.4*
Norway	*1.9*	*2.6*	0.2	-0.1	-0.3	0.5	0.0	0.3	1.1	-0.4	-0.6	1.3	0.2	1.7	*4.3*
Poland	*0.4*	*0.5*	0.8	-0.1	-0.5	1.2	-0.3	1.1	2.5	-0.6	-0.7	2.9	-0.8	3.2	*3.7*
Portugal	*0.2*	*0.2*	0.6	-0.1	-0.4	0.6	0.0	0.6	1.6	-0.5	-0.6	1.5	0.0	2.0	*2.2*
Slovak Republic	*0.3*	*0.3*	0.8	-0.1	-0.3	0.6	-0.3	0.7	2.8	-0.7	-0.5	1.7	-1.0	2.3	*2.6*
Spain	*0.2*	*0.2*	0.4	-0.1	-0.3	0.4	0.6	1.1	1.3	-0.4	-0.5	1.2	0.8	2.4	*2.6*
Sweden	*2.7*	*3.3*	0.2	-0.1	-0.3	0.6	-0.1	0.3	0.6	-0.3	-0.6	1.5	-0.2	1.1	*4.3*
Switzerland	*1.0*	*1.2*	0.3	-0.1	-0.3	0.4	0.0	0.4	0.9	-0.3	-0.5	1.2	0.2	1.4	*2.6*
Turkey	*0.1*	*0.1*	0.6	-0.1	-0.4	0.6	-0.4	0.4	2.2	-0.6	-0.6	1.6	-1.0	1.6	*1.8*
United Kingdom	*0.9*	*1.1*	0.5	-0.1	-0.3	0.6	0.0	0.6	1.5	-0.4	-0.6	1.4	0.0	1.9	*3.0*
United States	*0.7*	*0.9*	0.4	-0.1	-0.3	0.5	-0.1	0.4	1.3	-0.4	-0.6	1.4	0.0	1.7	*2.7*
Average	**0.9**	**1.1**	**0.6**	**-0.1**	**-0.3**	**0.6**	**0.1**	**0.8**	**1.7**	**-0.5**	**-0.6**	**1.5**	**0.0**	**2.2**	**3.3**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health); zero income elasticity; full Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Cost-containment scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.1	-0.4	0.3	-0.1	0.2	1.8	-0.5	-0.6	0.6	-0.2	1.1	*2.0*
Austria	*1.3*	*1.3*	0.5	-0.1	-0.3	0.2	0.0	0.3	1.6	-0.5	-0.5	0.6	0.0	1.2	*2.5*
Belgium	*1.3*	*1.5*	0.4	-0.1	-0.3	0.2	0.1	0.3	1.3	-0.4	-0.5	0.5	0.2	1.1	*2.6*
Canada	*1.0*	*1.2*	0.6	-0.1	-0.3	0.2	0.0	0.4	1.6	-0.4	-0.6	0.6	0.1	1.3	*2.4*
Czech Republic	*0.3*	*0.4*	0.6	-0.1	-0.2	0.2	0.0	0.5	2.1	-0.5	-0.4	0.5	-0.6	1.0	*1.3*
Denmark	*2.3*	*2.6*	0.3	-0.1	-0.3	0.2	-0.1	0.1	1.1	-0.4	-0.6	0.5	0.0	0.7	*3.3*
Finland	*2.3*	*2.9*	0.8	-0.1	-0.4	0.3	-0.2	0.4	1.9	-0.5	-0.6	0.6	-0.1	1.3	*4.2*
France	*1.0*	*1.1*	0.5	-0.1	-0.2	0.2	-0.2	0.2	1.7	-0.5	-0.5	0.5	-0.3	1.0	*2.0*
Germany	*1.0*	*1.0*	0.6	-0.1	-0.2	0.2	0.2	0.6	1.3	-0.4	-0.5	0.5	0.3	1.2	*2.2*
Greece	*0.2*	*0.2*	0.6	-0.1	-0.4	0.2	0.7	1.0	1.3	-0.4	-0.6	0.5	1.0	1.8	*2.0*
Hungary	*0.2*	*0.3*	0.7	-0.1	-0.4	0.4	-0.1	0.4	1.6	-0.5	-0.6	0.8	-0.5	0.7	*1.0*
Iceland	*2.3*	*2.9*	0.3	-0.1	-0.4	0.3	-0.1	0.0	1.0	-0.3	-0.7	0.6	-0.1	0.6	*3.4*
Ireland	*0.5*	*0.7*	0.3	-0.1	-0.6	0.4	0.8	0.9	1.3	-0.4	-0.8	0.8	1.5	2.4	*3.2*
Italy	*0.6*	*0.6*	0.7	-0.1	-0.2	0.2	0.6	1.1	1.8	-0.5	-0.5	0.5	0.9	2.2	*2.8*
Japan	*0.8*	*0.9*	1.0	-0.2	-0.2	0.2	0.1	0.9	2.0	-0.5	-0.5	0.5	0.0	1.5	*2.4*
Korea	*0.2*	*0.3*	1.4	-0.2	-0.3	0.3	-0.5	0.7	4.7	-1.0	-0.5	0.6	-1.0	2.8	*3.1*
Luxembourg	*0.5*	*0.7*	0.4	-0.1	-0.5	0.4	0.6	0.7	1.4	-0.4	-0.7	0.7	0.9	1.9	*2.6*
Mexico	*0.1*	*0.1*	0.7	-0.1	-0.5	0.3	0.5	0.8	2.6	-0.6	-0.8	0.7	1.0	2.9	*3.0*
Netherlands	*1.3*	*1.7*	0.5	-0.1	-0.3	0.2	0.2	0.4	1.1	-0.4	-0.6	0.5	0.5	1.2	*2.9*
New Zealand	*0.5*	*0.5*	0.7	-0.1	-0.3	0.2	-0.1	0.4	2.1	-0.5	-0.5	0.5	-0.4	1.2	*1.7*
Norway	*1.9*	*2.6*	0.2	-0.1	-0.3	0.2	0.0	0.1	1.1	-0.4	-0.6	0.5	0.2	0.9	*3.5*
Poland	*0.4*	*0.5*	0.8	-0.1	-0.5	0.5	-0.3	0.4	2.5	-0.6	-0.7	1.0	-0.8	1.3	*1.8*
Portugal	*0.2*	*0.2*	0.6	-0.1	-0.4	0.3	0.0	0.3	1.6	-0.5	-0.6	0.6	0.0	1.1	*1.3*
Slovak Republic	*0.3*	*0.3*	0.8	-0.1	-0.3	0.3	-0.3	0.3	2.8	-0.7	-0.5	0.7	-1.0	1.2	*1.5*
Spain	*0.2*	*0.2*	0.4	-0.1	-0.3	0.2	0.6	0.8	1.3	-0.4	-0.5	0.5	0.8	1.7	*1.9*
Sweden	*2.7*	*3.3*	0.2	-0.1	-0.3	0.3	-0.1	-0.1	0.6	-0.3	-0.6	0.6	-0.2	0.1	*3.4*
Switzerland	*1.0*	*1.2*	0.3	-0.1	-0.3	0.2	0.0	0.2	0.9	-0.3	-0.5	0.5	0.2	0.7	*1.9*
Turkey	*0.1*	*0.1*	0.6	-0.1	-0.4	0.3	-0.4	0.0	2.2	-0.6	-0.6	0.6	-1.0	0.7	*0.8*
United Kingdom	*0.9*	*1.1*	0.5	-0.1	-0.3	0.2	0.0	0.3	1.5	-0.4	-0.6	0.6	0.0	1.1	*2.1*
United States	*0.7*	*0.9*	0.4	-0.1	-0.3	0.2	-0.1	0.1	1.3	-0.4	-0.6	0.6	0.0	0.9	*1.8*
Average	**0.9**	**1.1**	**0.6**	**-0.1**	**-0.3**	**0.3**	**0.1**	**0.4**	**1.7**	**-0.5**	**-0.6**	**0.6**	**0.0**	**1.3**	**2.4**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health); zero income elasticity; half Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Sensitivity analysis: "Unitary income elasticity"

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.1	0.0	0.3	-0.1	0.6	1.8	-0.5	0.0	0.6	-0.2	1.7	*2.6*
Austria	*1.3*	*1.3*	0.5	-0.1	0.0	0.2	0.0	0.6	1.6	-0.5	0.0	0.6	0.0	1.7	*3.0*
Belgium	*1.3*	*1.5*	0.4	-0.1	0.0	0.2	0.1	0.6	1.3	-0.4	0.0	0.5	0.2	1.7	*3.2*
Canada	*1.0*	*1.2*	0.6	-0.1	0.0	0.2	0.0	0.7	1.6	-0.4	0.0	0.6	0.1	1.8	*3.0*
Czech Republic	*0.3*	*0.4*	0.6	-0.1	0.0	0.2	0.0	0.7	2.1	-0.5	0.0	0.5	-0.6	1.4	*1.7*
Denmark	*2.3*	*2.6*	0.3	-0.1	0.0	0.2	-0.1	0.4	1.1	-0.4	0.0	0.5	0.0	1.2	*3.9*
Finland	*2.3*	*2.9*	0.8	-0.1	0.0	0.3	-0.2	0.8	1.9	-0.5	0.0	0.6	-0.1	1.9	*4.8*
France	*1.0*	*1.1*	0.5	-0.1	0.0	0.2	-0.2	0.4	1.7	-0.5	0.0	0.5	-0.3	1.4	*2.5*
Germany	*1.0*	*1.0*	0.6	-0.1	0.0	0.2	0.2	0.8	1.3	-0.4	0.0	0.5	0.3	1.7	*2.7*
Greece	*0.2*	*0.2*	0.6	-0.1	0.0	0.2	0.7	1.4	1.3	-0.4	0.0	0.5	1.0	2.4	*2.6*
Hungary	*0.2*	*0.3*	0.7	-0.1	0.0	0.4	-0.1	0.8	1.6	-0.5	0.0	0.8	-0.5	1.3	*1.6*
Iceland	*2.3*	*2.9*	0.3	-0.1	0.0	0.3	-0.1	0.4	1.0	-0.3	0.0	0.6	-0.1	1.2	*4.1*
Ireland	*0.5*	*0.7*	0.3	-0.1	0.0	0.4	0.8	1.5	1.3	-0.4	0.0	0.8	1.5	3.2	*3.9*
Italy	*0.6*	*0.6*	0.7	-0.1	0.0	0.2	0.6	1.4	1.8	-0.5	0.0	0.5	0.9	2.7	*3.3*
Japan	*0.8*	*0.9*	1.0	-0.2	0.0	0.2	0.1	1.1	2.0	-0.5	0.0	0.5	0.0	2.0	*2.8*
Korea	*0.2*	*0.3*	1.4	-0.2	0.0	0.3	-0.5	1.1	4.7	-1.0	0.0	0.6	-1.0	3.4	*3.7*
Luxembourg	*0.5*	*0.7*	0.4	-0.1	0.0	0.4	0.6	1.3	1.4	-0.4	0.0	0.7	0.9	2.6	*3.3*
Mexico	*0.1*	*0.1*	0.7	-0.1	0.0	0.3	0.5	1.4	2.6	-0.6	0.0	0.7	1.0	3.7	*3.8*
Netherlands	*1.3*	*1.7*	0.5	-0.1	0.0	0.2	0.2	0.7	1.1	-0.4	0.0	0.5	0.5	1.7	*3.5*
New Zealand	*0.5*	*0.5*	0.7	-0.1	0.0	0.2	-0.1	0.7	2.1	-0.5	0.0	0.5	-0.4	1.7	*2.2*
Norway	*1.9*	*2.6*	0.2	-0.1	0.0	0.2	0.0	0.4	1.1	-0.4	0.0	0.5	0.2	1.5	*4.1*
Poland	*0.4*	*0.5*	0.8	-0.1	0.0	0.5	-0.3	0.9	2.5	-0.6	0.0	1.0	-0.8	2.1	*2.5*
Portugal	*0.2*	*0.2*	0.6	-0.1	0.0	0.3	0.0	0.7	1.6	-0.5	0.0	0.6	0.0	1.7	*1.9*
Slovak Republic	*0.3*	*0.3*	0.8	-0.1	0.0	0.3	-0.3	0.7	2.8	-0.7	0.0	0.7	-1.0	1.7	*2.0*
Spain	*0.2*	*0.2*	0.4	-0.1	0.0	0.2	0.6	1.1	1.3	-0.4	0.0	0.5	0.8	2.2	*2.3*
Sweden	*2.7*	*3.3*	0.2	-0.1	0.0	0.3	-0.1	0.3	0.6	-0.3	0.0	0.6	-0.2	0.7	*4.0*
Switzerland	*1.0*	*1.2*	0.3	-0.1	0.0	0.2	0.0	0.4	0.9	-0.3	0.0	0.5	0.2	1.2	*2.4*
Turkey	*0.1*	*0.1*	0.6	-0.1	0.0	0.3	-0.4	0.4	2.2	-0.6	0.0	0.6	-1.0	1.3	*1.4*
United Kingdom	*0.9*	*1.1*	0.5	-0.1	0.0	0.2	0.0	0.7	1.5	-0.4	0.0	0.6	0.0	1.6	*2.7*
United States	*0.7*	*0.9*	0.4	-0.1	0.0	0.2	-0.1	0.4	1.3	-0.4	0.0	0.6	0.0	1.5	*2.4*
Average	**0.9**	**1.1**	**0.6**	**-0.1**	**0.0**	**0.3**	**0.1**	**0.8**	**1.7**	**-0.5**	**0.0**	**0.6**	**0.0**	**1.9**	**2.9**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health); unit income elasticity; half Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Sensitivity analysis: "Compression of disability" scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.2	-0.4	0.3	-0.1	0.1	1.8	-1.0	-0.6	0.6	-0.2	0.6	*1.5*
Austria	*1.3*	*1.3*	0.5	-0.2	-0.3	0.2	0.0	0.2	1.6	-0.9	-0.5	0.6	0.0	0.7	*2.0*
Belgium	*1.3*	*1.5*	0.4	-0.2	-0.3	0.2	0.1	0.2	1.3	-0.8	-0.5	0.5	0.2	0.7	*2.2*
Canada	*1.0*	*1.2*	0.6	-0.2	-0.3	0.2	0.0	0.2	1.6	-0.9	-0.6	0.6	0.1	0.8	*1.9*
Czech Republic	*0.3*	*0.4*	0.6	-0.3	-0.2	0.2	0.0	0.3	2.1	-1.1	-0.4	0.5	-0.5	0.6	*0.9*
Denmark	*2.3*	*2.6*	0.3	-0.2	-0.3	0.2	-0.1	0.0	1.1	-0.7	-0.6	0.5	0.0	0.3	*2.9*
Finland	*2.3*	*2.9*	0.8	-0.3	-0.4	0.3	-0.2	0.2	1.9	-1.0	-0.6	0.6	-0.1	0.8	*3.7*
France	*1.0*	*1.1*	0.5	-0.2	-0.2	0.2	-0.2	0.1	1.7	-0.9	-0.5	0.5	-0.2	0.6	*1.6*
Germany	*1.0*	*1.0*	0.6	-0.2	-0.2	0.2	0.2	0.5	1.3	-0.8	-0.5	0.5	0.2	0.7	*1.7*
Greece	*0.2*	*0.2*	0.6	-0.3	-0.4	0.2	0.6	0.8	1.3	-0.8	-0.6	0.5	0.8	1.2	*1.4*
Hungary	*0.2*	*0.3*	0.7	-0.3	-0.4	0.4	-0.1	0.2	1.6	-0.9	-0.6	0.8	-0.4	0.4	*0.6*
Iceland	*2.3*	*2.9*	0.3	-0.2	-0.4	0.3	-0.1	-0.1	1.0	-0.7	-0.7	0.6	0.0	0.2	*3.1*
Ireland	*0.5*	*0.7*	0.3	-0.2	-0.6	0.4	0.8	0.7	1.3	-0.8	-0.8	0.8	1.2	1.7	*2.5*
Italy	*0.6*	*0.6*	0.7	-0.3	-0.2	0.2	0.6	0.9	1.8	-1.0	-0.5	0.5	0.7	1.5	*2.2*
Japan	*0.8*	*0.9*	1.0	-0.3	-0.2	0.2	0.1	0.8	2.0	-1.0	-0.5	0.5	0.0	1.0	*1.9*
Korea	*0.2*	*0.3*	1.4	-0.4	-0.3	0.3	-0.4	0.6	4.7	-2.0	-0.5	0.6	-0.8	2.0	*2.3*
Luxembourg	*0.5*	*0.7*	0.4	-0.2	-0.5	0.4	0.5	0.6	1.4	-0.8	-0.7	0.7	0.7	1.3	*2.0*
Mexico	*0.1*	*0.1*	0.7	-0.2	-0.5	0.3	0.4	0.7	2.6	-1.2	-0.8	0.7	0.8	2.1	*2.2*
Netherlands	*1.3*	*1.7*	0.5	-0.2	-0.3	0.2	0.2	0.3	1.1	-0.7	-0.6	0.5	0.4	0.7	*2.4*
New Zealand	*0.5*	*0.5*	0.7	-0.3	-0.3	0.2	-0.1	0.3	2.1	-1.1	-0.5	0.5	-0.3	0.7	*1.2*
Norway	*1.9*	*2.6*	0.2	-0.2	-0.3	0.2	0.0	0.0	1.1	-0.7	-0.6	0.5	0.2	0.5	*3.1*
Poland	*0.4*	*0.5*	0.8	-0.3	-0.5	0.5	-0.2	0.3	2.5	-1.2	-0.7	1.0	-0.6	0.9	*1.3*
Portugal	*0.2*	*0.2*	0.6	-0.2	-0.4	0.3	0.0	0.2	1.6	-0.9	-0.6	0.6	0.0	0.6	*0.8*
Slovak Republic	*0.3*	*0.3*	0.8	-0.3	-0.3	0.3	-0.3	0.2	2.8	-1.3	-0.5	0.7	-0.8	0.8	*1.1*
Spain	*0.2*	*0.2*	0.4	-0.2	-0.3	0.2	0.5	0.7	1.3	-0.8	-0.5	0.5	0.6	1.1	*1.3*
Sweden	*2.7*	*3.3*	0.2	-0.2	-0.3	0.3	-0.1	-0.2	0.6	-0.6	-0.6	0.6	-0.2	-0.1	*3.2*
Switzerland	*1.0*	*1.2*	0.3	-0.2	-0.3	0.2	0.0	0.1	0.9	-0.7	-0.5	0.5	0.1	0.3	*1.5*
Turkey	*0.1*	*0.1*	0.6	-0.2	-0.4	0.3	-0.4	-0.1	2.2	-1.1	-0.6	0.6	-0.8	0.3	*0.5*
United Kingdom	*0.9*	*1.1*	0.5	-0.2	-0.3	0.2	0.0	0.2	1.5	-0.8	-0.6	0.6	0.0	0.6	*1.7*
United States	*0.7*	*0.9*	0.4	-0.2	-0.3	0.2	-0.1	0.0	1.3	-0.8	-0.6	0.6	0.0	0.5	*1.4*
Average	**0.9**	**1.1**	**0.6**	**-0.2**	**-0.3**	**0.3**	**0.1**	**0.3**	**1.7**	**-0.9**	**-0.6**	**0.6**	**0.0**	**0.8**	**1.9**

NB: Assumptions used in this scenario:
Healthy ageing : Shift of 5 years in the dependency ratio; zero income elasticity; half Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Sensitivity analysis: "Expansion of disability" scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	0.0	-0.4	0.3	-0.2	0.3	1.8	0.0	-0.6	0.6	-0.3	1.5	*2.4*
Austria	*1.3*	*1.3*	0.5	0.0	-0.3	0.2	0.0	0.4	1.6	0.0	-0.5	0.6	0.0	1.6	*2.9*
Belgium	*1.3*	*1.5*	0.4	0.0	-0.3	0.2	0.1	0.4	1.3	0.0	-0.5	0.5	0.3	1.6	*3.1*
Canada	*1.0*	*1.2*	0.6	0.0	-0.3	0.2	0.0	0.5	1.6	0.0	-0.6	0.6	0.1	1.7	*2.9*
Czech Republic	*0.3*	*0.4*	0.6	0.0	-0.2	0.2	0.0	0.6	2.1	0.0	-0.4	0.5	-0.8	1.4	*1.8*
Denmark	*2.3*	*2.6*	0.3	0.0	-0.3	0.2	-0.1	0.2	1.1	0.0	-0.6	0.5	-0.1	1.0	*3.7*
Finland	*2.3*	*2.9*	0.8	0.0	-0.4	0.3	-0.3	0.5	1.9	0.0	-0.6	0.6	-0.1	1.8	*4.6*
France	*1.0*	*1.1*	0.5	0.0	-0.2	0.2	-0.2	0.3	1.7	0.0	-0.5	0.5	-0.3	1.4	*2.4*
Germany	*1.0*	*1.0*	0.6	0.0	-0.2	0.2	0.2	0.7	1.3	0.0	-0.5	0.5	0.4	1.7	*2.7*
Greece	*0.2*	*0.2*	0.6	0.0	-0.4	0.2	0.8	1.2	1.3	0.0	-0.6	0.5	1.2	2.4	*2.6*
Hungary	*0.2*	*0.3*	0.7	0.0	-0.4	0.4	-0.1	0.5	1.6	0.0	-0.6	0.8	-0.7	1.1	*1.3*
Iceland	*2.3*	*2.9*	0.3	0.0	-0.4	0.3	-0.1	0.1	1.0	0.0	-0.7	0.6	-0.1	0.9	*3.8*
Ireland	*0.5*	*0.7*	0.3	0.0	-0.6	0.4	0.9	1.1	1.3	0.0	-0.8	0.8	1.8	3.1	*3.9*
Italy	*0.6*	*0.6*	0.7	0.0	-0.2	0.2	0.7	1.3	1.8	0.0	-0.5	0.5	1.1	2.9	*3.5*
Japan	*0.8*	*0.9*	1.0	0.0	-0.2	0.2	0.1	1.1	2.0	0.0	-0.5	0.5	0.1	2.0	*2.9*
Korea	*0.2*	*0.3*	1.4	0.0	-0.3	0.3	-0.5	0.9	4.7	0.0	-0.5	0.6	-1.2	3.6	*3.9*
Luxembourg	*0.5*	*0.7*	0.4	0.0	-0.5	0.4	0.6	0.9	1.4	0.0	-0.7	0.7	1.1	2.5	*3.1*
Mexico	*0.1*	*0.1*	0.7	0.0	-0.5	0.3	0.5	1.0	2.6	0.0	-0.8	0.7	1.2	3.7	*3.9*
Netherlands	*1.3*	*1.7*	0.5	0.0	-0.3	0.2	0.2	0.6	1.1	0.0	-0.6	0.5	0.6	1.7	*3.4*
New Zealand	*0.5*	*0.5*	0.7	0.0	-0.3	0.2	-0.1	0.5	2.1	0.0	-0.5	0.5	-0.4	1.7	*2.1*
Norway	*1.9*	*2.6*	0.2	0.0	-0.3	0.2	0.0	0.2	1.1	0.0	-0.6	0.5	0.3	1.3	*3.9*
Poland	*0.4*	*0.5*	0.8	0.0	-0.5	0.5	-0.3	0.5	2.5	0.0	-0.7	1.0	-1.0	1.8	*2.2*
Portugal	*0.2*	*0.2*	0.6	0.0	-0.4	0.3	0.0	0.4	1.6	0.0	-0.6	0.6	0.0	1.6	*1.8*
Slovak Republic	*0.3*	*0.3*	0.8	0.0	-0.3	0.3	-0.3	0.5	2.8	0.0	-0.5	0.7	-1.3	1.7	*2.0*
Spain	*0.2*	*0.2*	0.4	0.0	-0.3	0.2	0.6	1.0	1.3	0.0	-0.5	0.5	1.0	2.3	*2.4*
Sweden	*2.7*	*3.3*	0.2	0.0	-0.3	0.3	-0.2	0.0	0.6	0.0	-0.6	0.6	-0.3	0.4	*3.6*
Switzerland	*1.0*	*1.2*	0.3	0.0	-0.3	0.2	0.0	0.3	0.9	0.0	-0.5	0.5	0.2	1.1	*2.3*
Turkey	*0.1*	*0.1*	0.6	0.0	-0.4	0.3	-0.4	0.1	2.2	0.0	-0.6	0.6	-1.2	1.0	*1.2*
United Kingdom	*0.9*	*1.1*	0.5	0.0	-0.3	0.2	0.0	0.4	1.5	0.0	-0.6	0.6	0.1	1.5	*2.6*
United States	*0.7*	*0.9*	0.4	0.0	-0.3	0.2	-0.1	0.2	1.3	0.0	-0.6	0.6	0.0	1.3	*2.2*
Average	**0.9**	**1.1**	**0.6**	**0.0**	**-0.3**	**0.3**	**0.1**	**0.6**	**1.7**	**0.0**	**-0.6**	**0.6**	**0.1**	**1.8**	**2.8**

NB: Assumptions used in this scenario:
Healthy ageing : No Health ageing adjustment; zero income elasticity; half Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Sensitivity analysis: "Increase in dependency" scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	0.2	-0.4	0.3	-0.2	0.5	1.8	0.7	-0.6	0.6	-0.4	2.2	*3.1*
Austria	*1.3*	*1.3*	0.5	0.2	-0.3	0.2	0.0	0.6	1.6	0.7	-0.5	0.6	0.0	2.3	*3.6*
Belgium	*1.3*	*1.5*	0.4	0.2	-0.3	0.2	0.1	0.6	1.3	0.6	-0.5	0.5	0.4	2.2	*3.7*
Canada	*1.0*	*1.2*	0.6	0.2	-0.3	0.2	0.0	0.6	1.6	0.7	-0.6	0.6	0.2	2.4	*3.6*
Czech Republic	*0.3*	*0.4*	0.6	0.2	-0.2	0.2	0.0	0.8	2.1	0.8	-0.4	0.5	-0.9	2.0	*2.4*
Denmark	*2.3*	*2.6*	0.3	0.1	-0.3	0.2	-0.1	0.3	1.1	0.5	-0.6	0.5	-0.1	1.5	*4.2*
Finland	*2.3*	*2.9*	0.8	0.2	-0.4	0.3	-0.3	0.7	1.9	0.7	-0.6	0.6	-0.1	2.5	*5.4*
France	*1.0*	*1.1*	0.5	0.2	-0.2	0.2	-0.2	0.4	1.7	0.7	-0.5	0.5	-0.4	2.0	*3.0*
Germany	*1.0*	*1.0*	0.6	0.2	-0.2	0.2	0.3	0.9	1.3	0.6	-0.5	0.5	0.5	2.4	*3.4*
Greece	*0.2*	*0.2*	0.6	0.2	-0.4	0.2	0.8	1.5	1.3	0.6	-0.6	0.5	1.5	3.3	*3.5*
Hungary	*0.2*	*0.3*	0.7	0.2	-0.4	0.4	-0.1	0.7	1.6	0.7	-0.6	0.8	-0.8	1.5	*1.8*
Iceland	*2.3*	*2.9*	0.3	0.1	-0.4	0.3	-0.1	0.2	1.0	0.5	-0.7	0.6	-0.1	1.4	*4.3*
Ireland	*0.5*	*0.7*	0.3	0.1	-0.6	0.4	1.0	1.3	1.3	0.6	-0.8	0.8	2.2	4.2	*4.9*
Italy	*0.6*	*0.6*	0.7	0.2	-0.2	0.2	0.7	1.6	1.8	0.7	-0.5	0.5	1.3	3.9	*4.5*
Japan	*0.8*	*0.9*	1.0	0.2	-0.2	0.2	0.1	1.3	2.0	0.8	-0.5	0.5	0.1	2.8	*3.7*
Korea	*0.2*	*0.3*	1.4	0.3	-0.3	0.3	-0.5	1.1	4.7	1.5	-0.5	0.6	-1.5	4.8	*5.1*
Luxembourg	*0.5*	*0.7*	0.4	0.2	-0.5	0.4	0.7	1.1	1.4	0.6	-0.7	0.7	1.4	3.4	*4.0*
Mexico	*0.1*	*0.1*	0.7	0.2	-0.5	0.3	0.6	1.2	2.6	0.9	-0.8	0.7	1.5	5.0	*5.1*
Netherlands	*1.3*	*1.7*	0.5	0.2	-0.3	0.2	0.2	0.8	1.1	0.5	-0.6	0.5	0.7	2.4	*4.1*
New Zealand	*0.5*	*0.5*	0.7	0.2	-0.3	0.2	-0.1	0.7	2.1	0.8	-0.5	0.5	-0.5	2.4	*2.8*
Norway	*1.9*	*2.6*	0.2	0.1	-0.3	0.2	0.0	0.3	1.1	0.5	-0.6	0.5	0.4	1.9	*4.5*
Poland	*0.4*	*0.5*	0.8	0.2	-0.5	0.5	-0.3	0.7	2.5	0.9	-0.7	1.0	-1.2	2.4	*2.8*
Portugal	*0.2*	*0.2*	0.6	0.2	-0.4	0.3	0.0	0.6	1.6	0.7	-0.6	0.6	0.0	2.2	*2.4*
Slovak Republic	*0.3*	*0.3*	0.8	0.2	-0.3	0.3	-0.3	0.6	2.8	1.0	-0.5	0.7	-1.6	2.3	*2.6*
Spain	*0.2*	*0.2*	0.4	0.2	-0.3	0.2	0.7	1.2	1.3	0.6	-0.5	0.5	1.2	3.1	*3.3*
Sweden	*2.7*	*3.3*	0.2	0.1	-0.3	0.3	-0.2	0.1	0.6	0.4	-0.6	0.6	-0.3	0.7	*4.0*
Switzerland	*1.0*	*1.2*	0.3	0.1	-0.3	0.2	0.0	0.4	0.9	0.5	-0.5	0.5	0.2	1.6	*2.8*
Turkey	*0.1*	*0.1*	0.6	0.2	-0.4	0.3	-0.4	0.2	2.2	0.8	-0.6	0.6	-1.5	1.6	*1.7*
United Kingdom	*0.9*	*1.1*	0.5	0.2	-0.3	0.2	0.0	0.6	1.5	0.6	-0.6	0.6	0.1	2.1	*3.2*
United States	*0.7*	*0.9*	0.4	0.2	-0.3	0.2	-0.1	0.3	1.3	0.6	-0.6	0.6	0.0	1.9	*2.8*
Average	**0.9**	**1.1**	**0.6**	**0.2**	**-0.3**	**0.3**	**0.1**	**0.7**	**1.7**	**0.7**	**-0.6**	**0.6**	**0.1**	**2.5**	**3.5**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health), but dependency rates increase by 0.5% per year; zero income elasticity; half Baumol effect; baseline participation ratios
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

Table A2.4 (cont.) Breakdown of the projections of long-term care expenditure for each driver

Sensitivity analysis: "Increased participation" scenario

	Long-term care expenditure as a % of GDP		Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Pure ageing effect	Adjustment for healthy ageing	Income effect	Cost disease effect	Effect of the participation rate of people aged 50-64	Total increase	Level as a % of GDP
		(0)	(1)	(2)	(3)	(4)	(5)	(6)=Sum (1) to (5)	(7)	(8)	(9)	(10)	(11)	(12)=Sum (7) to (11)	(13)=(0)+(12)
	2000 [1]	*2005* [e]	Increase in % points of GDP 2005-2025						Increase in % points of GDP 2005-2050						*2050*
Australia	*0.9*	*0.9*	0.6	-0.1	-0.4	0.3	0.3	0.6	1.8	-0.5	-0.6	0.6	1.0	2.3	*3.2*
Austria	*1.3*	*1.3*	0.5	-0.1	-0.3	0.2	0.6	0.9	1.6	-0.5	-0.6	0.6	2.9	4.0	*5.4*
Belgium	*1.3*	*1.5*	0.4	-0.1	-0.3	0.2	0.8	1.0	1.3	-0.4	-0.6	0.5	3.5	4.3	*5.9*
Canada	*1.0*	*1.2*	0.6	-0.1	-0.3	0.2	0.2	0.6	1.6	-0.4	-0.6	0.6	0.6	1.8	*2.9*
Czech Republic	*0.3*	*0.4*	0.6	-0.1	-0.2	0.2	0.3	0.8	2.1	-0.5	-0.4	0.5	1.3	2.9	*3.2*
Denmark	*2.3*	*2.6*	0.3	-0.1	-0.3	0.2	0.0	0.2	1.1	-0.4	-0.6	0.5	0.1	0.8	*3.5*
Finland	*2.3*	*2.9*	0.8	-0.1	-0.4	0.3	0.2	0.8	1.9	-0.5	-0.6	0.6	0.6	2.0	*4.9*
France	*1.0*	*1.1*	0.5	-0.1	-0.3	0.2	0.3	0.7	1.7	-0.5	-0.5	0.5	1.4	2.6	*3.7*
Germany	*1.0*	*1.0*	0.6	-0.1	-0.2	0.2	0.4	0.8	1.3	-0.4	-0.5	0.5	1.3	2.2	*3.2*
Greece	*0.2*	*0.2*	0.6	-0.1	-0.4	0.2	0.6	0.9	1.3	-0.4	-0.6	0.5	2.1	2.9	*3.0*
Hungary	*0.2*	*0.3*	0.7	-0.1	-0.5	0.4	0.9	1.4	1.6	-0.5	-0.7	0.8	4.0	5.2	*5.4*
Iceland	*2.3*	*2.9*	0.3	-0.1	-0.4	0.3	0.0	0.0	1.0	-0.3	-0.7	0.6	0.0	0.6	*3.5*
Ireland	*0.5*	*0.7*	0.3	-0.1	-0.6	0.4	1.2	1.2	1.3	-0.4	-0.8	0.8	2.0	2.9	*3.7*
Italy	*0.6*	*0.6*	0.7	-0.1	-0.3	0.2	1.0	1.4	1.8	-0.5	-0.5	0.5	4.3	5.6	*6.3*
Japan	*0.8*	*0.9*	1.0	-0.2	-0.2	0.2	0.1	0.9	2.0	-0.5	-0.5	0.5	0.0	1.5	*2.3*
Korea	*0.2*	*0.3*	1.4	-0.2	-0.4	0.3	0.2	1.4	4.7	-1.0	-0.6	0.6	1.1	4.8	*5.1*
Luxembourg	*0.5*	*0.7*	0.4	-0.1	-0.5	0.4	0.7	0.9	1.4	-0.4	-0.7	0.7	3.2	4.2	*4.9*
Mexico	*0.1*	*0.1*	0.7	-0.1	-0.5	0.3	0.4	0.7	2.6	-0.6	-0.8	0.7	1.7	3.6	*3.7*
Netherlands	*1.3*	*1.7*	0.5	-0.1	-0.3	0.2	0.4	0.7	1.1	-0.4	-0.6	0.5	1.5	2.1	*3.9*
New Zealand	*0.5*	*0.5*	0.7	-0.1	-0.3	0.2	0.0	0.5	2.1	-0.5	-0.5	0.5	0.1	1.6	*2.1*
Norway	*1.9*	*2.6*	0.2	-0.1	-0.3	0.2	0.1	0.1	1.1	-0.4	-0.6	0.5	0.3	1.0	*3.6*
Poland	*0.4*	*0.5*	0.8	-0.1	-0.6	0.5	0.8	1.4	2.5	-0.6	-0.8	1.0	3.7	5.8	*6.2*
Portugal	*0.2*	*0.2*	0.6	-0.1	-0.4	0.3	0.2	0.5	1.6	-0.5	-0.6	0.6	0.9	1.9	*2.1*
Slovak Republic	*0.3*	*0.3*	0.8	-0.1	-0.4	0.3	0.8	1.3	2.8	-0.7	-0.6	0.7	4.1	6.3	*6.6*
Spain	*0.2*	*0.2*	0.4	-0.1	-0.2	0.2	0.5	0.8	1.3	-0.4	-0.5	0.5	2.0	2.9	*3.0*
Sweden	*2.7*	*3.3*	0.2	-0.1	-0.3	0.3	0.0	0.1	0.6	-0.3	-0.6	0.6	0.0	0.3	*3.6*
Switzerland	*1.0*	*1.2*	0.3	-0.1	-0.3	0.2	0.0	0.2	0.9	-0.3	-0.5	0.5	0.2	0.7	*1.9*
Turkey	*0.1*	*0.1*	0.6	-0.1	-0.5	0.3	0.9	1.3	2.2	-0.6	-0.7	0.6	5.1	6.7	*6.8*
United Kingdom	*0.9*	*1.1*	0.5	-0.1	-0.3	0.2	0.2	0.5	1.5	-0.4	-0.6	0.6	0.6	1.6	*2.6*
United States	*0.7*	*0.9*	0.4	-0.1	-0.3	0.2	0.0	0.2	1.3	-0.4	-0.6	0.6	0.1	1.0	*1.9*
Average	**0.9**	**1.1**	**0.6**	**-0.1**	**-0.4**	**0.3**	**0.4**	**0.8**	**1.7**	**-0.5**	**-0.6**	**0.6**	**1.7**	**2.9**	**3.9**

NB: Assumptions used in this scenario:
Healthy ageing : dynamic equilibrium (1 year gains in life expectancy = 1/2 year in good health); zero income elasticity; half Baumol effect; participation ratios of 50-64 converge to 70% by 2050.
1. OECD, *Long-term care for older people* and Secretariat estimates.
e : Estimates, taking into account the observed expenditure growth between 2000 and 2002-03.
Source: Secretariat calculations.

ANNEX 2B. EMPIRICAL EVIDENCE ON THE HEALTH CARE INCOME ELASTICITIES

A brief survey of the literature

82. There is an extensive economic literature seeking to estimate the elasticity of demand for health care services. Whether health care is a luxury (elasticity above one) or a necessity (elasticity below one) is still an unsettled issue. Nevertheless, it seems to be well established that the measured income elasticity of health care depends on the level of analysis. Getzen (2000) argues that previous empirical work often failed to distinguish between sources of variation *between* groups and *within* groups: an individual within an insured group may have little reason or incentive to limit health expenditures, especially if the group is large and the individual's effect on the group is relatively insignificant, so the individual's health care spending is insensitive to income. The group's total expenditure on health care, on the other hand, *is* limited by group income. Thus, group spending will be more responsive to income than individual spending, and wider groupings (say, nations composed of regions) will be even more responsive.

83. Table A3 provides a summary of a number of studies, arrayed by level of aggregation. In general, the higher the level of aggregation, the higher the estimated income elasticity of health care spending. Studies of individual expenditures show that the majority of the variation of spending (50% to 90%) is associated with individual differences in health status, while income elasticities are small or negative (Newhouse and Phelps, 1976; AMA, 1978; Manning *et al.,* 1987; Sunshine and Dicker, 1987; Wedig, 1988; Wagstaff *et al.,* 1991; AHCPR, 1997). However, analysis of pre-1960 data where insurance is less prevalent and most payment is made out-of-pocket show much larger income elasticity (0.2 to 0.7) (Falk *et al.,* 1933; Anderson *et al.,* 1960; Weeks, 1961). Similarly, consumption of dentistry, plastic surgery, counselling, eyeglasses and other types of care that are still less well-insured show income elasticities that are strongly positive, and sometime substantially exceed 1 (USPHS, 1960; Andersen and Benham, 1970; Silver, 1970; AMA, 1978; Scanlon, 1980; Sunshine and Dicker, 1987; AHCPR, 1997; Parker and Wong, 1997). At the macro level, studies of national expenditures consistently show income elasticities greater than 1, with above 90% of cross-sectional and time-series variation explainable by difference in per capita income, and differences in health status having negligible effects (Abel-Smith, 1967; Kleiman, 1974; Newhouse, 1977, Maxwell, 1981; Leu, 1986; Culyer, 1988; Getzen, 1990; Getzen and Poullier, 1992; Schieber, 1990; Gerdtham *et al*., 1992).

[Table A3: Survey of income elasticity estimates of health care expenditures (or utilisation) by level of observation]

84. The use of time-series data, individually or pooled in cross-section, inevitably raises the question of whether any observed relationship between health care expenditure and income is spurious, as it is likely that both variables are integrated of the order one, I(1). Using unit root and co-integration tests, Gerdtham and Löthgren (2000, 2002) conclude that health care expenditure and GDP for a panel of OECD countries are characterised by unit roots and are co-integrated. They assert that such co-integration relationship suggests a long-run equilibrium between health care expenditure and GDP in the given sample of OECD countries. Using a dataset of health care expenditures and disposable personal income for the states in the U.S. over the years 1986-1998, Freeman (2003) found that health care expenditures and incomes at state level are non-stationary and co-integrated and estimated income elasticity of health care at 0.817 to 0.844. These findings are close to the estimates of Di Matteo and Di Matteo (1998) for Canadian provincial data.

85. Using panel co-integration techniques, Dreger and Reimers (2005) investigated the link between health care expenditures and GDP for a sample of 21 OECD countries. Their model also incorporates medical progress, proxied by different variables like life expectancy and infant mortality. Their analysis concludes that the income elasticity may not be too different from unity, which implies that health care expenditure is not a luxury good. Furthermore, the main determinants of future health expenditure growth is medical progress. As regards national projections, the more sophisticated evidence points to a coefficient at or below unity rather than above.

86. Despite this empirical evidence suggesting a long-run relationship between health expenditure and income, recent studies have indicated that the observed increasing health care expenditure as a share of GDP is likely due to other factors such as technological change (Hall and Jones, 2004; Okuande and Murthy, 2002; Blomqvist and Carter, 1997; Fuchs, 1987). Time-series (panel data) estimates of health care elasticities that fail to control for the role of technological change would therefore tend to be upward biased. But also cross-sectional analysis could be similarly biased, appreciating that they represent the long-term income elasticity. Together with the aggregation problems cited above, technological advances could also provide an explanation for the high estimates of income elasticities found at the macro level. On the other hand, Di Matteo and Di Matteo (1988) argue that because health care is labour intensive, its cost may increase as a function of average income, so that measured income elasticity is blurred by the price effect. Since the price elasticity is presumably negative, the income coefficient is likely to be biased downward.[33]

Econometric estimates

87. A simple econometric test illustrates how the estimates of the health spending income elasticity can be sensitive to different specifications (Table A4). The sample corresponds to a panel of the 30 OECD countries for the period 1970-2002. The basic data are from the OECD Health Data Base (2005). The comparison of the different estimates shows that, starting from a value well above one, the income elasticity tends to decrease when additional variables are added in the regression. Not having a good proxy for the effect of technology and/or relative prices, time trends were added in the regression. With such time trends, the income elasticity becomes significantly lower than one, at around 0.9. Allowing for country-specific dynamic effects, a mean-pooled group estimate was also carried out. It produces an estimate of income elasticity around 1.1. The last column of Table A4 shows an estimate where the income elasticity was actually constrained to be unitary. This allows having an alternative estimate of the expenditure residual growth that can be compared with the accounting approach that was used in the main text. It can be seen that the coefficient for the time trend decreases substantially from 2.1% in the 1970s to 1% per year in the 1990s.

[Table A4. Econometric estimates of the income elasticity of health spending]

33 For a comprehensive overview of key studies that explicitly estimate price elasticity for health services, see Ringel *et al*.,(2002).

Table A3: Survey of income elasticity estimates of health care expenditures (or utilisation) by level of observation

INDIVIDUALS (micro)	Income elasticity
General (insured/mixed)	
Newhouse and Phelps (1976)	≤ 0.1
AMA (1978)	≈ 0
Sunshine and Dicker (1987)	≈ 0
Manning *et al*. (1987)	≈ 0
Wedig (1988)	≈ 0
Wagstaff *et al.* (1991)	≤ 0
Hahn and Lefkowitz (1992)	≤ 0
AHCPR (1997)	≤ 0
Special / uninsured	
Falk *et al*. (1933)	0.7
Weeks (1961)	0.3
Anderson *et al*. (1960) (1953 data)	0.4
Anderson *et al*. (1960) (1958 data)	0.2
Other	
USPHS (1960) (physician visits)	0.1
USPHS (1960) (dental visits)	0.8
AMA (1978) (dental expenses)	1.0-1.7
Andersen and Benham (1970) (physician expenses)	0.4
Andersen and Benham (1970) (dental expenses)	1.2
Silver (1970) (physician expenses)	0.85
Silver (1970) (dental expenses)	2.4-3.2
Newman and Anderson (1972) (dental expenses)	0.8
Feldstein (1973) (dental expenses)	1.2
Scanlon (1980) (Nursing home expenses)	2.2
Sunshine and Dicker (1987) (dental expenses)	0.7-1.5
Hahn and Lefkowitz (1992) (dental expenses)	1.0
AHCPR (1997) (dental expenses)	1.1
Parker and Wong (1997) (Mexico, total expenses)	0.9-1.6
REGIONS (intermediate)	
Feldstein (1971) (47 states, 1958-1967, $hospital)	0.5
Fuchs and Kramer (1972) (33 states, 1966, $physician)	0.9
Levit (1982) (50 states, 1966, 1978, $total)	0.9
McLauglin (1987) (25 SMSAs, 1972-1982, $hospital)	0.7
Baker (1997) (3073 US counties, 1986-1990, $Medicare)	0.8
Di Matteo and Di Matteo (1998) (10 Canadian provinces 1965-1991)	0.8
NATIONS (macro)	
Abel-Smith (1967) (33 countries, 1961)	1.3
Kleiman (1974) (16 countries, 1968)	1.2
Newhouse (1977) (13 countries, 1972)	1.3
Maxwell (1981) (10 countries, 1975)	1.4
Gertler and van der Gaag (1990) (25 countries, 1975)	1.3
Getzen (1990) (US, 1966-1987)	1.6
Schieber (1990) (seven countries, 1960-1987)	1.2
Gerdtham *et al*. (1992) (19 countries, 1987)	1.2
Getzen and Poulllier (1992) (19 countries, 1965-1986)	1.4
Fogel (1999) (United States, long run)	1.6

Source: Getzen (2000)

Table A4. Econometric estimates of the income elasticity of health spending

Dependant variable: Log health expenditures per capita	Fixed-effects	Fixed-effects	Fixed-effects	Fixed-effects	Fixed effects and income elasticity constrained = 1	Mean-pooled group estimates
Log GDP per capita	1.583*** (0.028)	0.937*** (0.063)	0.893*** (0.062)	0.865*** (0.062)	..	1.15*** (0.069)
Log average population age	..	..	1.561** (0.264)	1.63** (0.261)	1.56** (0.259)	1.00** (0.250)
Time trend	..	0.0168*** (0.001)	0.010** (0.001)	..	..	..
Time trend 70s	..	..	..	0.025** (0.003)	0.021** (0.003)	..
Time trend 80s	..	..	..	0.015** (0.002)	0.013** (0.0018)	..
Time trend 90s	..	..	..	0.012** (0.001)	0.010** (0.001)	..
R2 (within) *Nb. observations*	*0.82* *756*	*0.83* *756*	*0.84* *756*	*0.85* *756*	*0.49* *756*	 *540*

Note: Panel 30 OECD countries, 1970-2002
*** significant at 1% and ** at 5%.
Standard errors in brackets
Source: Secretariat calculations

ANNEX 2C. OBESITY TRENDS IN OECD COUNTRIES

88. Obesity has reached epidemic proportions globally, with more than one billion adults overweight – at least 300 million of those clinically obese – and is a major contributor to the global burden of chronic diseases and disability. Unchecked, obesity may in the near future erode the healthy longevity gains attained by today's elderly, imposing an additional burden on health care costs.

89. There are three factors appearing to be the main drivers behind these trends:

- How much we eat: Rapid agricultural productivity growth has brought food prices, in real terms, to the lowest level in history. Moreover, the average calorie availability has ballooned. At the beginning of the 1960's, nearly 40% of the population in developing countries was chronically undernourished, while over-nutrition and obesity were marginal and geographically narrowly defined problems. By the turn of the millennium, the rather homogenous picture of undersupplies and hunger had changed completely. The prevalence of under-nourishment had fallen in all regions except for sub-Saharan Africa and a few countries in South-Asia to levels below 10%. Projections suggest this trend will continue. All in all, average food energy supplies in 43 countries, home of about 3.5 billion people, will be above the 3 200 kcal mark by 2030.[34] At these levels of average dietary energy supply, over-nutrition is likely to become a growing problem also in developing countries. And, where income disparities remain high, under-nourishment and over-nutrition are likely to co-exist within the same country (OECD, 2004).

- What we eat: "A calorie is a calorie" is not all true. Increased consumption of more energy-dense, nutrient-poor foods with high levels of sugar and saturated fats have contributed to obese rates rising three-fold or more since 1980 in some areas of North-America, the United Kingdom, Eastern Europe, the Middle East, the Pacific Islands, Australasia and China.[35]

- How we live: Urbanization and adjustment to a service economy is causing a more sedentary lifestyle, *i.e.,* desk jobs and urban developments that are friendly to cars but hostile to walking and biking. The occasional gym visit does not compensate for the decline in utilitarian physical activity like walking children to school, walking to the corner store, or walking to work (Sturm and Lakdawalla, 2004).

90. Obesity is defined as weight that is dangerously excessive because of its high proportion of body fat relative to lean body mass. A common screener for obesity is the Body Mass Index (BMI). BMI is a person's weight in kilograms divided by height in meters squared. Because BMI does not distinguish body fat from bone and muscle mass, the index can misclassify some people, such as those with large bones and muscles. The standard BMI categories are as follows: underweight (BMI less than 18.5), normal (18.5 to 24.9), overweight (25 to 29.9) and obese (30 or more). These definitions are based on evidence that suggests health risks are greater at or above a BMI of 25 compared to those below that level. The risk of death, although modest until a BMI of 30 is reached, increases with an increasing Body Mass Index (US

34 The US Department of Agriculture estimates that the average man needs 2 900 calories per day (assuming light to moderate activity). The average woman needs 2 200 calories.

35 See http://www.who.int/dietphysicalactivity/media/en/gsfs_obesity.pdf

Department of Health and Human Services, 2001). The United States has the highest share of obese people, 30% (Figure A1). Moreover, the fastest growing group of obese Americans are "severely" obese. Between 1986 and 2000, the proportion of moderately obese individuals (those with a BMI of 30-35) merely doubled in the United States. In contrast, the proportion of individuals with a BMI of 40 or greater quadrupled (Sturm and Lakdawalla, 2004).

[Figure A1: Obesity rates in OECD countries]

91. According to WHO, non-fatal, but debilitating health problems associated with obesity include respiratory difficulties, chronic musculoskeletal problems, skin problems and infertility. The more life-threatening problems fall into four main areas: cardio-vascular diseases; conditions associated with insulin resistance such as type-2 diabetes; certain types of cancer, especially the hormonally related and large bowel cancer; and gallbladder disease. The likelihood of developing type-2 diabetes and hypertension rises steeply with increasing body fatness. Confined to older adults for most of the XX^{th} century, this disease now affects obese children even before puberty. About 85% of people with diabetes are type-2, and of these, 90% are obese or overweight. In the analysis carried out for World Health Report 2002, about 58% of diabetes, 21% of ischemic heart disease and 8-42% of certain cancers globally were attributable to a BMI above 21. Looking forward, the increasing incidence of child obesity is of special concern. Overweight children and adolescents are more likely to become overweight or obese adults (US Department of Health and Human Services, 2001).

92. The traditional focus on disability research has been on the elderly, with good reason. Chronic disability is much more prevalent among the elderly, and it has a more direct impact on the demand for medical care. Still, the largest increase in obesity has primarily occurred among younger cohorts (Sturm *et al*., 2004) sparking the question whether the trend in disability among young may diverge from that of the old. Casting light on these idiosyncrasies requires quite detailed and longitudinal data. Several US studies suggest that while disability among the elderly is falling, the opposite is happening for younger cohorts. These trends could have serious implications for future health care spending because more disability at younger ages almost certainly translates into more disability among tomorrow's elderly, and disability is one of the key predictors of health care spending. Main suggestions from some of the studies addressing this theme are depicted below.

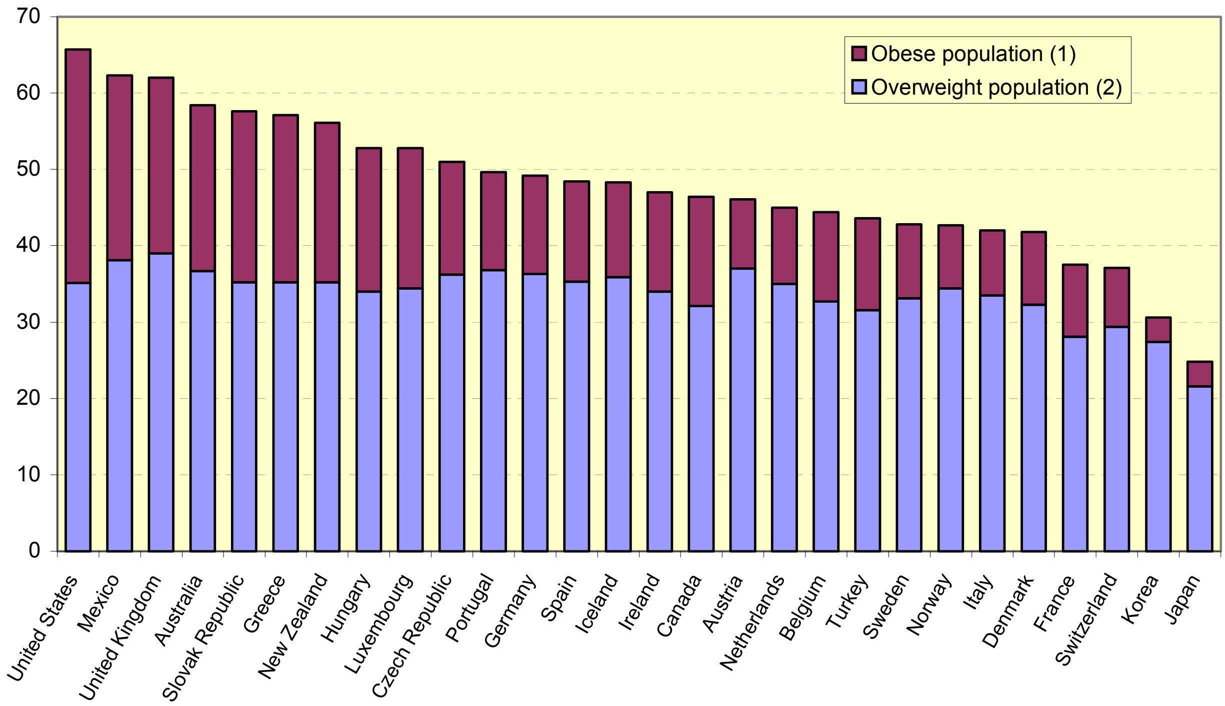
93. Lakdawalla *et al.,* (2004) use data from the National Health Interview Survey (NHIS) to present a detailed analysis of disability trends in the population ages 18-69. This analysis reveals substantial growth in reported rates of disability in the population younger than age fifty but not among the elderly. These trends do not appear to be the result of changes in the composition of the population or of changes in specific survey procedures. It is suggested that obesity and its attendant disorders are particularly associated with these trends. Sturm *et al.*, (2004) employ data from the Health and Retirement Study (HRS) and the Behavioural Risk Factor Surveillance Survey (BRFSS) and conclude that if current trends in obesity continue, disability rates will increase by one per cent a year more in the 50-59 age group than if there were no further weight gains. Cutler *et al.*, (2004) emphasize that forecasts based on trends in the disability only among the old are misleading. The study combines data from the Medicare Current Beneficiary Survey (MCBS) and the NHIS. The forecasts imply that per capita Medicare costs will decline the next 15-20 years in accordance with recent declines in disability among the elderly.[36] By 2020, however, per capita costs begin to rise as a result of growth in disability among younger persons. Andreyeva *et al.,* (2004) use data from the HRS and find that there are large differences in obesity related to health care costs by degree of obesity. Thus, widely cited average effects of obesity on health care costs

36 Assuming that disability trends are the one thing influencing the otherwise constant health care spending, *i.e.,* no technological advances etc.

obscure major differences across degrees of obesity and will under-predict future health care costs because the prevalence of more severe obesity is growing at a much faster rate than the spread of obesity in general.

94. Recent literature on obesity, disability and health care costs therefore seem uniform. Rising disability rates among the future elderly could wipe out recent reductions in disability among today's elderly, who have benefited from reduced exposure to disease, better medical care, and reduced smoking. Appreciating that these are studies on American citizens, the trend appears global in nature, and there is no compelling reason why the trend in other western countries should diverge. Admittedly, one could argue that this obesity trend will decrease in speed, if anything because the alternative would lead to greater individual dissatisfaction and a further squeeze on the public purse. Still, quantifying possible future developments on unchanged trends, *ceteris paribus*, provides important insight and makes the traditional scenario of ever falling disability rates a fairly optimistic one.

Figure A1. **Obesity rates in OECD countries**



1. Percentage of total population with Body Mass Index (BMI) >30 kg/m^2.
2. Percentage of total population with 25<BMI<30 kg/m^2.
Source: OECD Health database (2005).

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