



Use of hospital and long-term institutional care services in relation to proximity to death among older people in Finland

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ABSTRACT

Using nationally-representative register data for older people in Finland in period 1998–2003 we study how the number of days in acute hospital and long term institutional care services varies by age and proximity to death and how these use patterns change as mortality improves. Acute health care use depends more on proximity to death than on age, a finding often interpreted as showing that the need for care services among older people will be substantially less than would be expected based on the likely increase in population numbers. We show that this assumption is too optimistic for three reasons: (1) the increase in population numbers will be concentrated mainly among the “old old” where use of services is substantial; (2) earlier findings of much lower use of acute care services by older than younger people who are close to death are not observed; and (3) any savings in acute care are more than offset by greater use of residential long-term care (LTC). The main consequences of improving mortality are: (1) to postpone rather than to reduce overall demand for health care; (2) to shift the balance of care from acute to long-term care services; and (3) to increase considerably the average age of time spent in care. We further construct a new indicator “care-free life expectancy” based on number of days in hospital and long-term care to summarise care use patterns for cohorts under a range of plausible mortality assumptions. As mortality improves, lifetime use of acute hospital and long-term care after age 65 and the proportion of life spent in LTC increases for later cohorts, but the proportion spent in acute care decreases slightly.

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Introduction

One of the major concerns relating to population ageing is provision and financing of acute health and long term social care services for the older population. For example, the numbers of people aged 80 and over in Finland is projected to double in the next 20 years (Official Statistics of Finland (OSF), 2009). Per capita use of health care services by both men and women rises sharply with age. A widely-used assumption in projections is that demand for health care remains constant within each sex and age group so changes in use of services depend directly on changing numbers. This simple model may be modified to incorporate information about likely changes in health status or in the costs of treatment; in both cases there are arguments that such changes could serve to increase or to decrease expenditure since it is unclear whether, for example, health status will improve or deteriorate (Breyer, Costa-Font, & Felder, 2010).

Studies for a number of decades have pointed out that costs of acute health care services, principally based on use of hospital services,

are greater at any given age for those who die relatively shortly afterwards (‘decedents’ – typically defined as those who die within the next 12 months) compared with those who survive (‘survivors’). The implications of whether health care use is affected more by proximity to death rather than by age are potentially substantial in terms of the likely additional resources associated with ageing populations. Increased longevity will lead to more years spent alive at older ages where needs are greatest so demand increases if age is the key driver. However, if the future number of deaths is the key factor, then a more relaxed view may be justified since expected requirements for older people in a given year are likely to be less than anticipated for three main reasons. First, the number of deaths increases more slowly than population size. Second, increasing the age of death will shift health care expenditure further into the future, which would be expected to make it cheaper since these costs are discounted and developments in care provision in the intervening period might reduce costs (Payne, Laporte, Deber, & Coyte, 2007). Finally, later age at death is beneficial in cost terms since most studies show that acute health care costs in the last year of life are generally lower for people who die at older than at younger ages probably due to a combination of factors such as decisions that aggressive interventions are less worthwhile at older ages and age discrimination (Brockmann, 2002).

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Review of previous research

Acute care costs and proximity to death

Timmer and Kovar (1971) found that the median cost for hospital and institutional care during the last year of life of US adults aged 25 and over who died in 1964 and 1965 was almost three times higher than for survivors. A more detailed study by Lubitz and Prihoda (1984) confirmed the importance of proximity to death and led Fuchs (1984, p. 152) to conclude that health care spending among older people depended on time to death rather than time since birth. Scitovsky (1994) showed that there were major differences in expenditure close to death by age. While annual expenditure per survivor rose by 55% between age groups 65–69 and 90 and over (\$1455 to \$2258), for decedents it fell by 42% (from \$15,346 to \$8888).

As health care costs continued to rise, interest in the role of proximity to death on costs increased. Interest in the topic in Europe was stimulated by a paper by Zweifel, Felder, and Meiers (1999) who used data from two Swiss insurance funds. They argued that ageing was a “red herring” for future acute health costs since health care expenditure depends on remaining lifetime but not on calendar age, at least beyond age 65. The Organisation for Economic Co-operation and Development (2006) and the EU (Economic Policy Committee and European Commission, 2009) have since incorporated proximity to death in forecasts of health care.

Summaries of studies in Payne et al. (2007) and Raitano (2006) confirm that acute hospital care and physician costs in the last year of life typically account for about one third of lifetime costs (or after age 65), but many studies have little or no information on expenditure on nursing home or other social care and drugs. Polder, Barendregt, and van Oers (2006) used Dutch health insurance data for 2.1 million persons in 1999 that included home care and nursing home costs. Health care costs were €1100 per person on average, but costs per decedent were 13.5 times higher at €15,000 in their last year of life. The largest component was hospital care (54%) followed by nursing home care (19%). Most studies considered the relationship between closeness to death and health costs only for relatively short durations before death, but Seshamani and Gray (2004a) used British data to show that cost increases could be identified up to 15 years prior to death. Hospital care costs were 10 times greater in the last year of life than in the fifth year before death, whereas the average increase in costs between age 65 and 85 was only 30%.

LTC use and proximity to death

Older people are much greater users of long-term social care including residential (nursing home) care, the costs of which rise sharply with age as with acute care. However, it is less clear whether use of such social care services is related primarily to age or to proximity to death, although this has substantial implications for future demand for long-term care. Roos, Montgomery, and Roos (1987) analysed a sample of 60,000 people in the comprehensive provincial health insurance scheme in Manitoba with universal coverage without deductibles or co-payments (apart from a low board and lodging payment in nursing homes). They used average number of days spent in hospital or nursing home and physician visits as indicators of service use (while the provider may be more concerned with the cost of provision, from the point of view of the user, number of days spent within the health care system may be more meaningful indicator of their use of the health care system). The annual average number of nursing home days among men rose rapidly with age from 4.0 (women 6.2) at ages 65–74 to 64.7 (women 107.5) at ages 85 and over. They concluded that “those dying at older ages have more rather than less expensive deaths,

largely due to heavy nursing home use by the very elderly, at least in a health care system with no financial barriers to access nor usage limitations” (Roos et al., 1987, p. 245), even though earlier studies had shown that hospital costs were lower for older than for younger decedents.

McGrail et al. (2000) found in British Columbia that proximity to death was more important than age in determining acute care costs but that these costs fall with later age at death. However, any savings on hospital costs of very old decedents were offset by increased long term care costs. Spillman and Lubitz (2000) combined Medicare information on acute care from with estimated nursing home and other costs including prescription drugs and dental care. They calculated total lifetime costs after reaching age 65 as \$31,000 for a person dying at age 65 but over \$200,000 for someone who dies at age 90, since the latter figure was heavily influenced by high use of nursing homes at older ages. Yang, Norton, and Stearns (2003) found that time to death is the main reason for higher acute hospital care expenditures among older Medicare beneficiaries, whereas age is the main reason for higher long-term care expenditure (for which Medicaid was a major source of funding). However, proximity to death also retained influence on social care costs (Bardsley, Georghiou, & Dixon, 2010; Cutler & Sheiner, 1998; Murphy & Martikainen, 2010; Schulz, Leidl, & Konig, 2004; Werblow, Felder, & Zweifel, 2007). Average nursing home expenditure is typically about twice as high for those who die within one or two years as for those who survive (Polder et al., 2006; Weaver, Stearns, Norton, & Spector, 2009; Yang et al., 2003).

Resource implications of including proximity to death in forecasts

Stearns and Norton (2004, p. 315) concluded that the evidence for the importance of proximity to death for projections of future health care costs was such that it is now “time to include time to death”. This has been done in a number of countries, almost always including a comparison of simple models using age-specific assumptions about rates of expenditure or service use and ones that include rates disaggregated by both age and proximity to death, while keeping other variables constant apart from changing mortality.

If proximity to death was included in the calculations, for the US, Cutler and Sheiner (1998) estimated that Medicare spending per person between 1992 and 2030 with age-specific spending remaining constant would reduce by 3% per year but increase by 1% per year if it was not. By incorporating the end-of-life dimension, Wanless (2002) estimated that the expected growth rate of British NHS expenditure to be about one seventh lower over the period 2002–2022, and Seshamani and Gray (2004b, p.558) argued that the rate of increase in hospital spending due to ageing in England would be halved over the period 2002–2026. Differences between the two studies arise from the latter study’s restriction to hospital costs where the 1% of people dying in the year account for 29% of hospital costs and incorporation of proximity to death effects at all durations rather than in the final year of life. In Denmark, Madsen, Serup-Hansen, and Kristiansen (2002) estimated that in the period 1995–2020, acute health care costs would increase by 18.5% with rising population numbers when projections were based on age specific cost profiles, but by 15.1% when survivor status in the year was also included, a reduction of one fifth. For Sweden, the increase in health care for inpatient and outpatient care demand over the period 2000–2030 would be 18% with the simple age-specific model, but over one third lower, 11%, by including proximity to death (Batljan & Lagergren, 2004). Polder et al. (2006) estimated a 10% reduction in the growth rate of future health expenditure for the Netherlands by including proximity to death compared to not doing so. In Germany, Schulz et al. (2004) forecast bed days for both hospital care, where proximity to death of up to four years was

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