

The Economic Burden of Disease due to Stroke in the Netherlands

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Background

Innovations and major improvements in stroke care, such as structured stroke units and the use of thrombolysis have been raising post-stroke surviving rates for the past ten years. Previous research shows that stroke has a major influence on health related quality of life (HRQoL), expressed in utilities and quality adjusted life years (QALYs) and healthcare consumption (expressed in costs) [1-5]. To our knowledge, there is limited evidence of the changes in costs and utilities over time in stroke research. Since research into the costs of stroke and quality of life after stroke in the Netherlands is out-dated [5-7] and cost-of-illness (COI) studies of stroke with a bottom-up design are absent, there is much interest in quantifying the costs of stroke and estimate its economic impact.

Aim

The aim of this study is to determine the burden of stroke in the Netherlands through (1) estimating the healthcare consumption after stroke expressed in costs, (2) determining HRQoL after stroke expressed in utilities and QALYs and (3) investigate their relation.

Methods

- Design is a burden of disease (BoD) study focusing on costs (COI) and QoL
- Clinically confirmed stroke patients (18+) were followed one year post stroke
- Cost data gathered through a cost-questionnaire (bottom-up design)
- The cost questionnaire captured three dimensions of costs:
 - Health care costs
 - Productivity costs
 - Costs of informal care
- The 5 dimensional EuroQol (EQ-5D) was used to derive utilities
- Questionnaires conducted at two months (T2), six months (T3) and one year (T4) post stroke
- Healthcare costs based on The Dutch Manual for Cost Analysis

Results

- A total of 395 patients were found eligible for this study
- After excluding patients (n= 41) who had 66% missing data or more, 354 patients were included in this analysis
- Figure 1 shows the average annual costs per domain on the cost-questionnaire:
 - Nights spent in hospital induces €8480 per patient annually, making it the largest cost category
 - Second largest cost category are nights spent in a rehabilitation clinic for which €6310 was paid annually
 - Least money is spent on home care and paramedical care; €163 and €229 respectively

References

1. Achten, D., et al., *Life satisfaction of couples 3 years after stroke*. Disability and rehabilitation, 2012. 34(17): p. 1468-72.
2. Alguren, B., et al., *Factors associated with health-related quality of life after stroke: a 1-year prospective cohort study*. Neurorehabilitation and neural repair, 2012. 26(3): p. 266-74.
3. Han, B. and W.E. Haley, *Family caregiving for patients with stroke. Review and analysis*. Stroke; a journal of cerebral circulation, 1999. 30(7): p. 1478-85.
4. Visser-Meily, A., et al., *Psychosocial functioning of spouses of patients with stroke from initial inpatient rehabilitation to 3 years poststroke: course and relations with coping strategies*. Stroke; a journal of cerebral circulation, 2009. 40(4): p. 1399-404.
5. Struijs, J.N., et al., *Future costs of stroke in the Netherlands: the impact of stroke services*. International journal of technology assessment in health care, 2006. 22(4): p. 518-24.
6. Evers, S.M., G.L. Engel, and A.J. Ament, *Cost of stroke in The Netherlands from a societal perspective*. Stroke; a journal of cerebral circulation, 1997. 28(7): p. 1375-81.
7. Van Exel J, Koopmanschap MA, Van Wijngaarden JD, Sholte-Op-Reimer WJ: Costs of stroke and stroke services: determinants of patients costs and comparison of costs of regular care and care organised in stroke services. *Cost Eff Resour Alloc* 2003, 1:2.

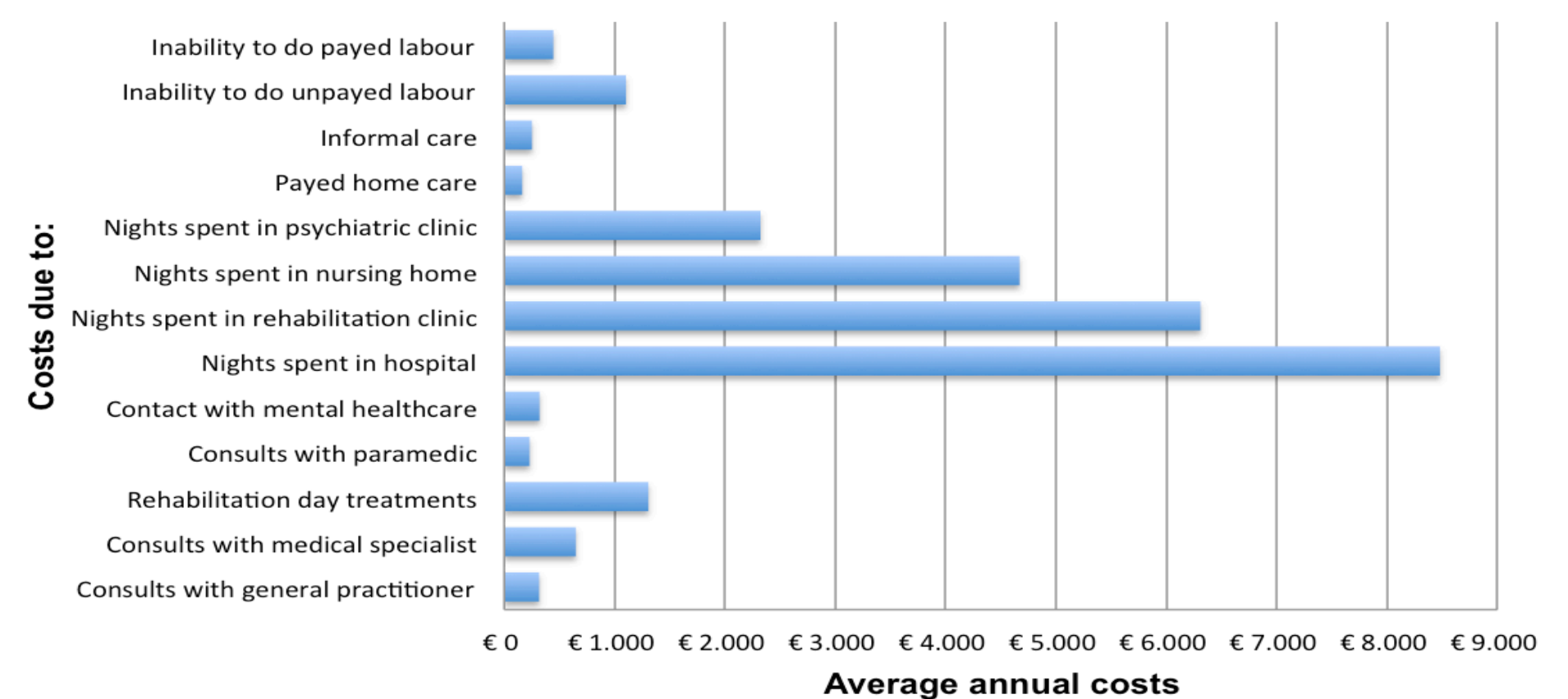


Figure 1. Average annual costs per patient per costs category

➢ Figure 2 shows the total average patient costs and average patient utility score over time:

- Utility scores increase over time; 0,73 at 2 months post stroke (PS), 0,75 at 6 months PS and 0,77 12 months PS
- Costs increase from 2 months PS to 6 months PS, from €8738 to €12492
- 6 months later average costs have decreased to €5333

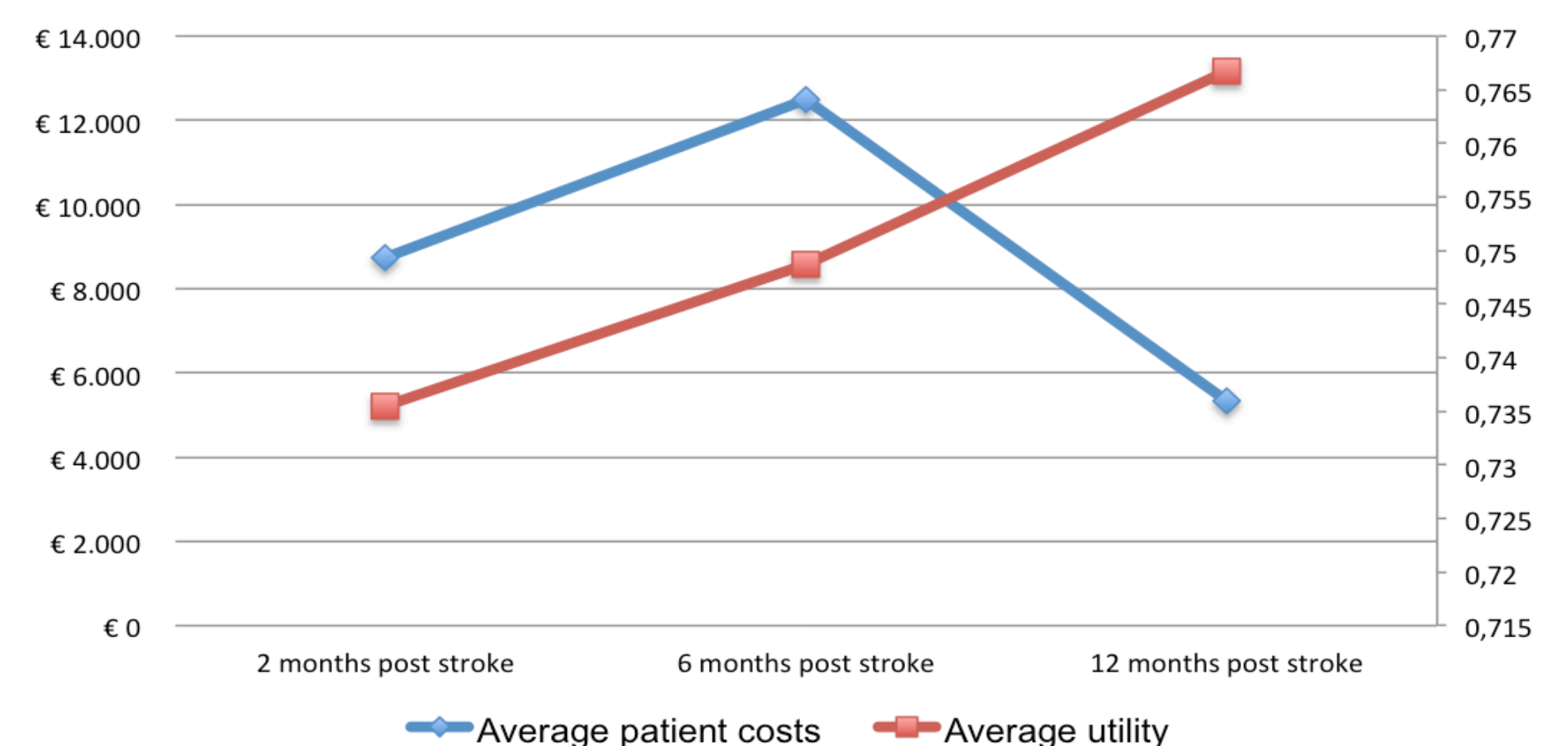


Figure 2. Average patient costs and utility scores over time

Preliminary conclusion

- The burden of disease due to stroke is severe, proved by limited increase of QoL and high economic impact over time
- Limited variation in utility scores indicate the severe long term consequences of stroke influencing quality of life
- Major cost categories such as hospital care and rehabilitation show that stroke survivors depend heavily on healthcare services, hence inducing high health care costs