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What Drives the Increase in Health Costs with Age

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Health care expenditure (HCE) and age

- HCE has risen faster then GDP in all OECD countries, at least since 1970, with great variation among countries.
- Aggregate HCE is driven by technological change in medicine, institutional setting, income effect and Baumoll effect, but age structure remains significant factor.
- HCE is an important part of consumption in NTA - what drives the shape of HCE-age profile?

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Main findings

- HCE-age relation is not trivial
- changes of morbidity and the treatment more important than changes in mortality for HCE
- rise of HCE with age driven by the prevalence of healthcare and intensity of treatment, whereas unit costs are less important
- age patterns differ greatly with the type of care
- after the age of 70 the intensity of healthcare use and the unit cost drop
- gender differences in HCE are pregnancy related

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Polish National Health Fund

- 50% of USA GDP per capita, HCE per capita in Poland belong to the lowest in the OECD
- 98% of Poles entitled for NHS, funded by employers and employees contributions (Bismarck type)
- 60% of HCE financed by NHS, 80% of NHS costs ascribed to age
- break-down by age, gender, type and **decedents and survivors**
- data imitations: just a fraction of long term care costs, cross-section from 2012

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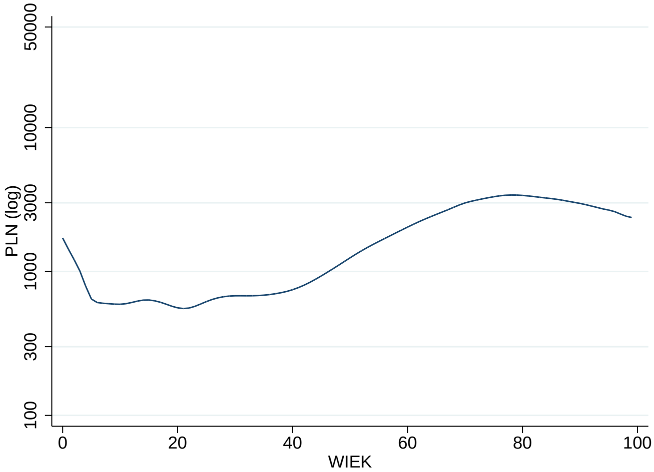
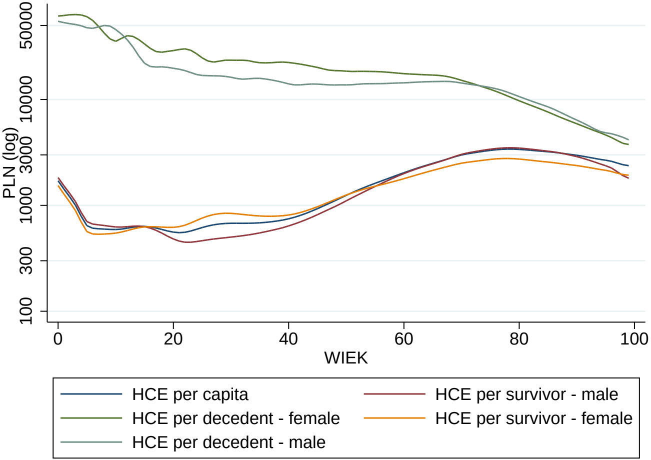
Is health care expenditure and age relation trivial? ! :



maybe not trivial



Decomposition method

Observing identity (for every age group) :

$$H = H^s + H^d = \frac{H^s}{I^s} \quad \frac{I^s}{U^s} \quad \frac{U^s}{S^s} \quad \frac{S^s}{P} \quad P$$
$$+ \quad \frac{H^d}{I^d} \quad \frac{I^d}{U^d} \quad \frac{U^d}{S^d} \quad \frac{D^s}{P} \quad P$$

assuming that each factor is an independent function (process) of age:

$$H(a) = h^s(a) \quad i^s(a) \quad u^s(a) \quad (1 - d(a)) \quad P(a)$$
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and applying total derivative with respect to age let us disentangling the contribution of every factor to the differences between consecutive age groups.

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- costs of unit of treatment (expenditure per incident)
  - of survivor user - ($h_a^{s,u} = \frac{H_a^s}{I_a^s}$),
  - of decedent user - ($h_a^{d,u} = \frac{H_a^d}{I_a^d}$),
- intensity of treatment (incidents per user)
  - survivor - ($i_a^s = \frac{I_a^s}{U_a^s}$)
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- prevalence of treatment (users ratio in the population)
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- share of decedents (death rate) - ($d_a = \frac{D_a}{P_a}$)
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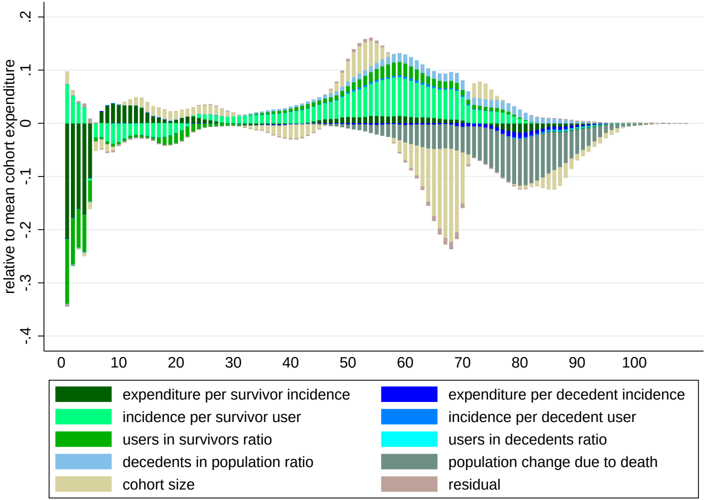
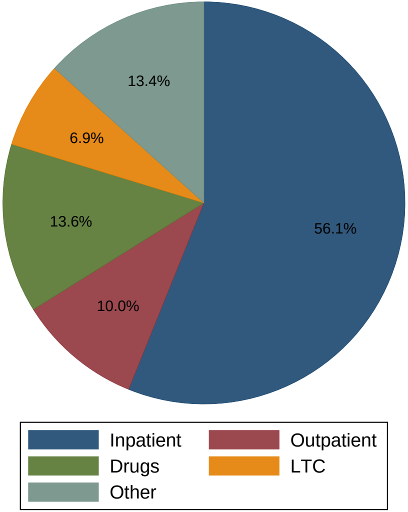
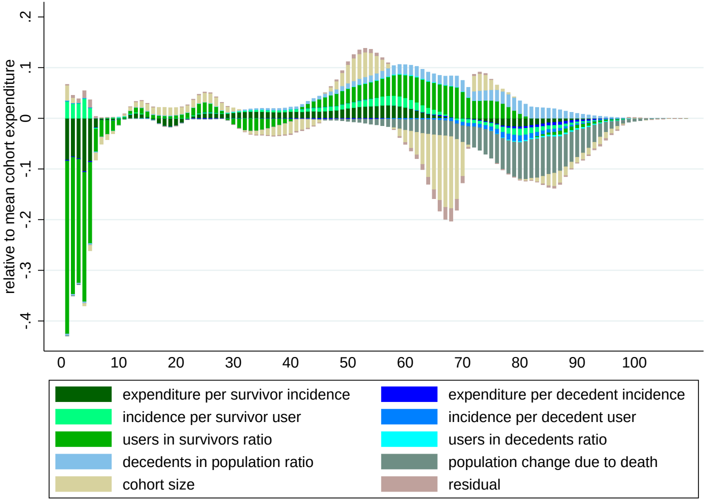
HCE in general driven by intensity of care



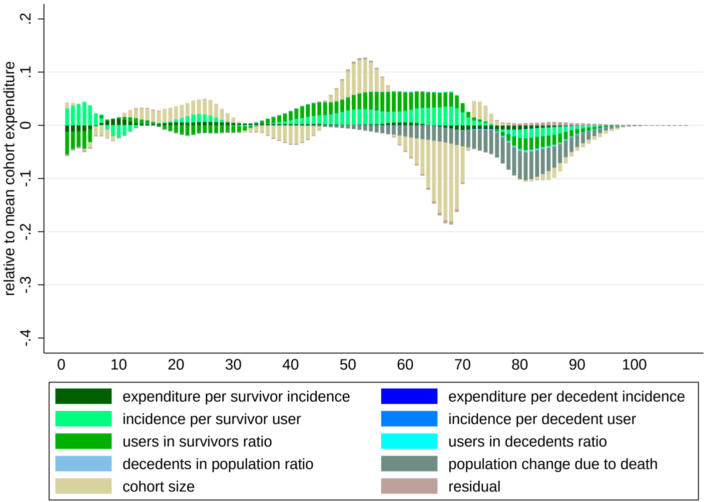
Hospital outlays dominate HCE



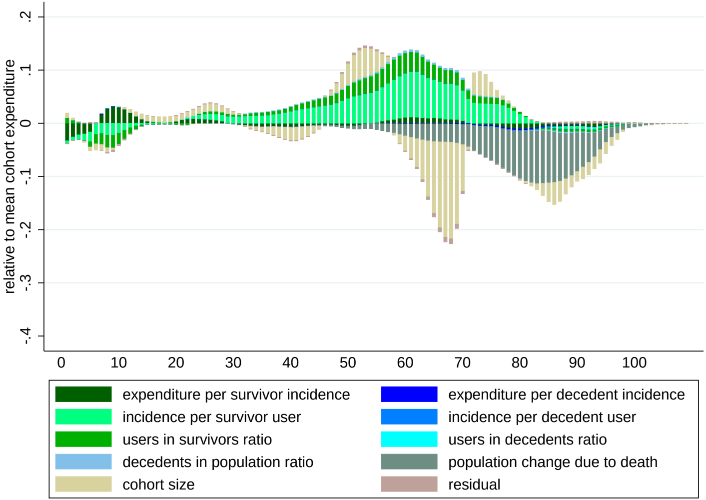
Hospital expenditures driven by prevalence of illness



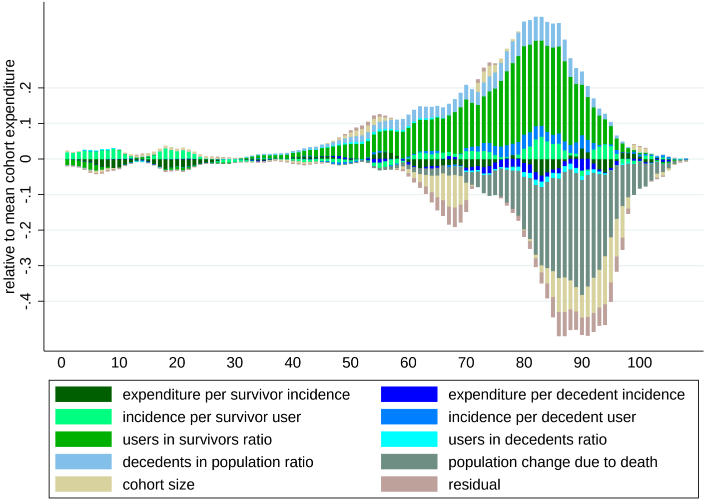
Ambulatory care driven by intensity and prevalence



Drugs spendings driven by intensity of use



LTC driven by prevalence and death rate



Conclusions

- morbidity patterns (prevalence and intensity of treatment) is crucial for age-dependence of HCE
- mortality drop without a change in morbidity (due to treatment) leads to steepening of HCE with age
- future changes of morbidity patterns and disease specific treatment crucial for consequences of ageing on the HCE
- the the intensity and unit costs of treatment stop raising at the age-span 70-80

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