

The Global Activity Limitation Indicator and Self-Rated Health are good predictors of mortality

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Background

Self-Rated Health (SRH) is a widely used and validated health measure and an excellent predictor of mortality, morbidity, functional status, disability and health consumption. The Global Activity Limitation Indicator (GALI) - which identifies subject with longstanding (at least 6 months) limitations by severity level due to a health problem - has been developed more recently and is increasingly used as a standard to calculate healthy life expectancies within Europe.

Research Questions

- What is the predictive power of the GALI on mortality?
- Does the GALI predict mortality better than SRH?
- Does the impact on mortality differ by gender?
- Does the impact on mortality differ by follow-up period?

Methods

Data

Belgian Health Interview Survey 2001
8,583 individuals aged 15 years and older
Mortality follow-up of the participants
from date of interview until 31/12/2010
individual linkage using a unique identifier

Statistical methods

The predictive power of the GALI and SRH is assessed by Mortality Rate Ratios (MRRs) obtained from Poisson regression models. The first models estimate MRRs for the GALI and SRH separately, while the second also adjust for age (after lexis expansion), gender and education and explore interactions between each health measure and gender. A third model includes the GALI, SRH and adjusts for the other covariates (Table 1). The impact of the follow-up period is assessed by comparing MRRs at different times of the follow-up, adjusting for all covariates (Table 2).

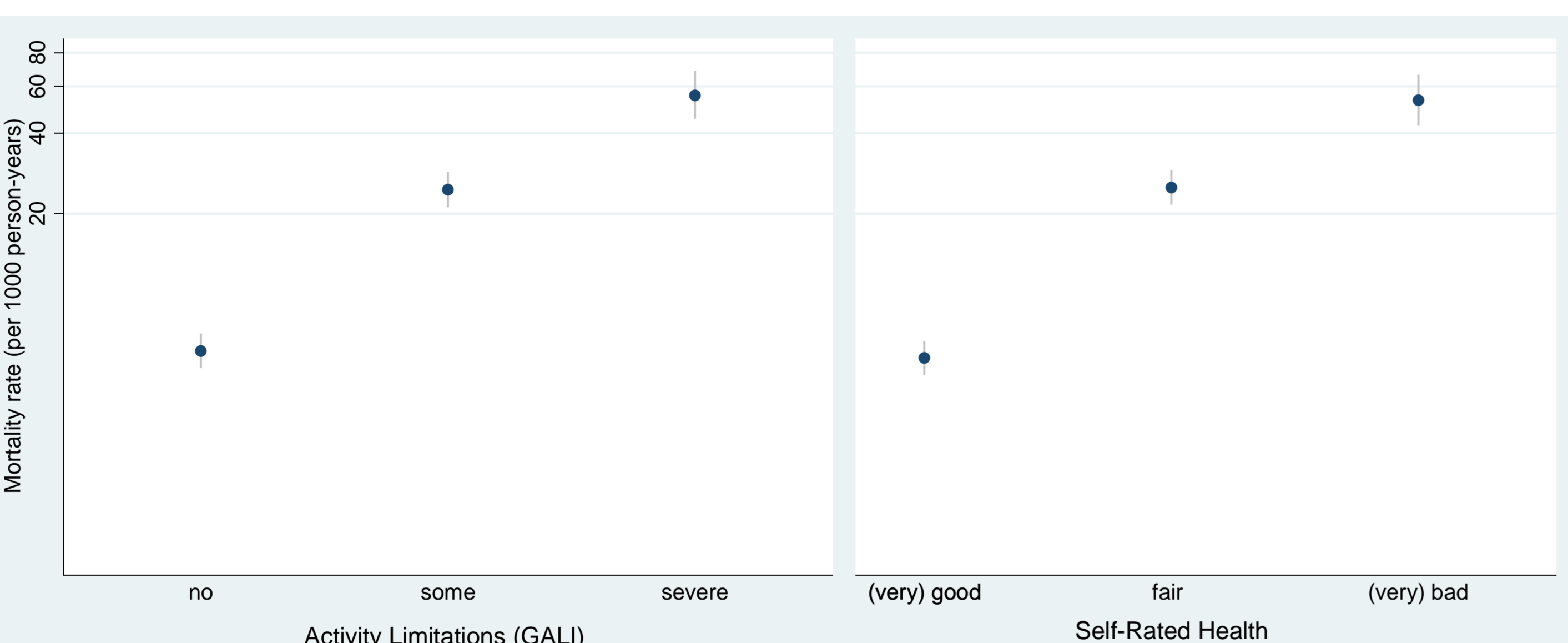


Figure 1. Mortality rate (per 1000 person-years) by level of activity limitations (GALI) and level of Self-Rated Health in the 10-year follow-up of the Belgian Health Interview Survey 2001.

Results

The GALI and SRH are associated with mortality: as the level of ill-health increases, the mortality rate increases (Figure 1). The mortality rate is about 4 times higher for individuals with moderate limitations and more than 9 times higher for those with severe limitations, as compared to none. For SRH, the crude estimates are very similar (Table 1).

When adjusting for other predictors of mortality (age (in particular), gender and education), MRRs decrease for both the GALI and SRH, but remain significant. No interaction effect was found between the health measures and gender in any of the models fitted.

In a global model including the GALI, SRH and other covariates we found that both measures had a significant effect on mortality. Moderate limitations / fair health increase mortality rates by about 1.5. The effect of severe limitations is higher (MRR=1.8). The highest MRR was found for (very) bad health (2.4).

The impacts of the GALI and SRH decrease over the follow-up time (Table 2). Moderate limitations and fair health do not have a significant effect on mortality in the last years (6-10 years) of the follow-up (MRRs=1.2). The effect of severe limitations decreases from 2.8 (in the first 3 years of follow-up) to 1.5 (in the last period). The impact of (very) bad health seems less affected by the period of follow-up.

Table 1. Impact of activity limitations (GALI) and Self-Rated Health (SRH) on long-term mortality

	crude		adj. for age, gender, edu.		adj. for age, gender, edu., health (GALI or SRH)	
	MRR	(95% CI)	MRR	(95% CI)	MRR	(95% CI)
Activity limitations (GALI)						
no limitation	1.0		1.0		1.0	
moderate limitation	4.2	(3.6-4.8)	1.7	(1.5-2.0)	1.4	(1.2-1.6)
severe limitation	9.5	(8.0-11.3)	3.0	(2.5-3.5)	1.8	(1.5-2.3)
interaction with gender	-		N.S.		N.S.	
Self-Rated Health						
(very) good	1.0		1.0		1.0	
fair	3.9	(3.4-4.5)	1.7	(1.5-2.0)	1.5	(1.3-1.9)
(very) bad	9.9	(8.2-11.9)	3.5	(2.9-4.2)	2.4	(1.9-3.0)
interaction with gender	-		N.S.		N.S.	

adj. adjusted, edu. education, CI confidence interval, MRR mortality rate ratio, N.S. not significant

Table 2. Impact of activity limitations (GALI) and Self-Rated Health (SRH) on mortality, by follow-up period

	0-3 years		3-6 years		6-10 years	
	MRR	(95% CI)	MRR	(95% CI)	MRR	(95% CI)
Activity limitations (GALI)						
no limitation	1.0		1.0		1.0	
moderate limitation	1.6	(1.0-2.3)	1.5	(1.1-2.0)	1.2	(0.9-1.6)
severe limitation	2.8	(1.7-4.5)	1.7	(1.1-2.5)	1.5	(1.0-2.1)
Self-Rated Health						
(very) good	1.0		1.0		1.0	
fair	1.7	(1.2-2.6)	1.6	(1.2-2.1)	1.2	(0.9-1.6)
(very) bad	3.0	(1.8-4.9)	1.9	(1.3-3.0)	2.5	(1.7-3.5)

CI confidence interval, MRR mortality rate ratio

Note: The model adjusts for age, gender and education.

Conclusion

The Global Activity Limitation Indicator (GALI) and Self-Rated Health (SRH) are good predictors of mortality.

The predictive power of the GALI and SRH is gender invariant.

On the short term, the GALI and SRH are strong and comparable predictors of mortality.

After several years of follow-up, moderate limitations and fair health do not predict mortality any more; the impact of severe limitation is reduced.

Our study contribute to the further validation of the Global Activity Limitation Indicator.