

To what degree do religiosity and spirituality explain healthy life expectancy gaps across Europe?

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BACKGROUND

Research linking individuals' **religious and spiritual behaviours and beliefs** with their **health** goes back decades.^{1,2} However this research is limited as it is mainly restricted to the U.S., and has almost universally considered mortality and health outcomes separately, rather than in a combined indicator like healthy life expectancy (HLE). We **aimed** to address this gap by examining the extent to which measures of **religiosity** and **spirituality** explain the **variation** in **self-reported health** (SRH) and **HLE** across **Europe**.

METHODS

Dataset:

- Fourth wave of the European Values Survey (EVS 2008) comprising interviews of around 70,000 individuals across 47 European countries

Measures:

Health

- The EVS has one health question: "Describe your state of health these days; very good, good, fair, poor or very poor?"
- For analysis, we defined good **self-rated health** (SRH) as good or very good responses, and poor SRH as the remainder (fair, poor, very poor)

Religiosity and spirituality

Relevant questions were selected to tap four dimensions of religiosity, and then recoded from 0 (non-religious) to high (most religious):

- frequency of **attendance** at religious services (score 0-6)
- frequency of **prayer** (score 0-6)
- **belief** in God (score 0-3)
- **importance of religion** (score 0-3)

Statistical methods:

Individual level analysis

Association between the four dimensions of religiosity and SRH were assessed by **country-specific ordinal logistic regression models**, adjusted for age, sex and education.

Country level analyses

Healthy Life Expectancy (HLE) was calculated by the **Sullivan method**,³ with life tables by country from the Human Mortality Database. Associations between religiosity and HLE at age 20 (HLE20) were examined by **meta-regression**, first unadjusted and then adjusted by country-level factors: % with low education, GDP, and generalized index of inequality (GINI). P-values were adjusted for multiplicity by permutation tests. Country level values of each of the four dimensions of religiosity were summarised by the within-country **coefficient of variation** (SD/mean) for each religiosity measure.

RESULTS

Religiosity and SRH

- Analytic sample of 65,303 aged 20 years and over and with complete information on the nine variables used to compile the four dimensions of religiosity
- 44% were men and the main religious denomination was Roman Catholic
- Overall 60% (n=38,874) reported good SRH; poor SRH was more likely to be reported by women (OR=1.35, 95% CI 1.31-1.39, p<0.0001) and older people aged 50+ years (OR=3.52, 95% CI 3.41-3.64)
- Belief in God showed the least association with good SRH whilst frequency of attendance at religious services showed the greatest. **All four dimensions** of religiosity had **significant positive associations with SRH** in **Germany** (Table 1)

Table 1: Countries with significant associations between SRH and each dimension of religiosity (ordinal logistic regression models adjusted for age, sex and education)

Significant association with health	Attendance	Prayer	Importance of religion	Belief in God
Positive (Odds ratios > 1 - greater religiosity = better SRH)	Azerbaijan, Austria, Bosnia Herzegovina, Croatia, Finland, Georgia, Germany , Great Britain, Greece, Ireland, Poland	Bosnia Herzegovina, Germany , Turkey	Austria, Bosnia Herzegovina, Germany	Germany , Iceland Macedonia,
Negative (Odds ratios < 1 - greater religiosity = poorer SRH)	Albania	Azerbaijan, Belgium, Belarus, Czech Republic , Estonia, France, Latvia, Moldova, Russian Federation, Slovak Republic, Switzerland	Belarus, Czech Republic , Denmark, Slovak Republic	Czech Republic , Norway

Religiosity and HLE

- Meta-regression models included 41 countries due to unavailability of life tables (Kosovo, Northern Cyprus), GINI (Bosnia, Malta) or GDP (Great Britain, Northern Ireland)
- HLE20 ranged from 14.9 years (Russian Federation) to 50.3 years (Ireland) in men, and 13.5 years (Russian Federation) to 48.8 years (Ireland) in women
- **Attendance** and **importance of religion** were significantly associated with **LE20**, but only in **women**, in unadjusted models and models excluding GDP (Table 2)
- **Importance of religion** was significantly associated with **HLE20**, but only in **women**, in unadjusted models and models excluding GDP
- Significant religiosity coefficients were positive, suggesting greater variance (SD) or lower mean religiosity was associated with higher LE20 or HLE20

Table 2: Results of meta-regression models for association of religiosity dimensions and life expectancy at age 20 (LE20) and healthy life expectancy at age 20 (HLE20)

Dimension	Sex	Unadjusted β (95% CI)	p-value	Fully adjusted* β (95% CI)	p-value	Adjusted excluding GDP** β (95% CI)	p-value	
LE20	Attendance	M	1.78 (-2.12, 5.69)	0.36	-0.99 (-4.15, 2.18)	0.94	1.03 (-3.16, 5.22)	0.94
		F	3.08 (-0.14, 6.31)	0.06	0.72 (-1.64, 3.07)	0.92	3.56 (0.33, 6.79)	0.07
Prayer	M	3.09 (-1.67, 7.85)	0.19	-0.47 (-4.32, 3.38)	0.99	2.38 (-2.66, 7.41)	0.69	
	F	4.51 (1.31, 7.71)	0.007	1.48 (-0.91, 3.87)	0.54	4.32 (1.19, 7.45)	0.02	
Importance of religion	M	4.91 (-2.19, 12.03)	0.17	-0.69 (-6.78, 5.39)	0.99	4.32 (-3.49, 12.15)	0.58	
	F	5.59 (0.79, 10.39)	0.02	1.95 (-1.65, 5.55)	0.63	6.44 (1.52, 11.36)	0.03	
Belief in God	M	4.26 (-3.42, 11.93)	0.29	-1.38 (-7.88, 5.12)	0.98	4.04 (-4.29, 12.36)	0.67	
	F	4.80 (-1.24, 10.84)	0.12	1.33 (-3.07, 5.70)	0.92	6.12 (-0.07, 12.31)	0.13	
HLE20	Attendance	M	3.63 (-3.53, 10.79)	0.31	-2.43 (-8.08, 3.23)	0.86	2.79 (-4.73, 10.33)	0.84
		F	12.12 (1.89, 22.34)	0.02	1.87 (-6.79, 10.53)	0.98	13.29 (2.45, 24.13)	0.06
Prayer	M	4.09 (-4.94, 13.14)	0.36	-3.96 (-10.95, 3.03)	0.70	2.95 (-6.44, 12.33)	0.89	
	F	14.78 (3.76, 25.80)	0.01	1.93 (-7.05, 10.90)	0.98	13.05 (1.37, 24.74)	0.07	
Importance of religion	M	7.67 (-5.61, 20.96)	0.25	-5.41 (-16.51, 5.69)	0.79	7.04 (-7.39, 21.46)	0.69	
	F	20.44 (4.80, 36.08)	0.01	2.83 (-11.25, 16.89)	0.98	22.35 (4.95, 39.74)	0.04	
Belief in God	M	6.67 (-7.58, 20.91)	0.35	-6.49 (-18.23, 5.25)	0.70	6.89 (-8.35, 22.13)	0.73	
	F	18.83 (-0.96, 38.62)	0.06	0.16 (-16.56, 16.89)	0.99	21.79 (-0.18, 43.78)	0.14	

*adjusted for education level, GDP, and Gini coefficient

** adjusted for education level and Gini coefficient

CONCLUSIONS

The relationship between different aspects of religiosity and health varied substantially across European countries, although there was some evidence that frequency of attendance was associated with LE20 and importance of religion with LE20 and HLE20 but only in women. Longitudinal data are needed to explore this at an individual level.

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REFERENCES

1. Hiltner S. Religion and health. New York: Macmillan; 1943.
2. Lawler-Row KA, Elliott J. The role of religious activity and spirituality in the health and well-being of older adults. Journal of Health Psychology. 2009;14(1):43.
3. Sullivan DF. A single index of mortality and morbidity. Health Services Mental Health Administration Health Reports. 1971;86:347-54.