

# Disability and life expectancy over the XXth century: the role of culture

## *Extended abstract*

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## **Short abstract**

Ongoing research shows that during the XXth century, life expectancy of disabled people has improved less than for people without disabilities. This paper aims to uncover the cultural causes of this phenomenon. Following established results in economic history, we will exploit mass emigration in Sweden at the end of the XIXth century and US immigration reforms in 1913 as a source of exogenous variation for collectivist cultural traits. We will then compare the life expectancy of individuals with disabilities across villages that experienced different levels of increases in collectivistic traits. To do so, we rely on rich parish registries that detail, among others, individual-level disabilities by type of impairment and migrations between the early XIXth century and 1960. In the absence of structured welfare services, we expect disabled people from more collectivist villages to live longer thanks to the support of other citizens.

# 1 Introduction

Medical innovations during the XXth century improved life expectancy dramatically. Yet, ongoing research shows that life expectancy has not followed the same positive trajectory for people with a disability, whose rate of early mortality relative to non-disabled people increased over time (Junkka et al., 2021).<sup>1</sup> These dynamics might be driven by the lower effectiveness of medical innovations on patients with disabilities. Nevertheless, efforts to research medical interventions for disabled people and to provide them with care have underlying societal and cultural causes. For instance, disabled individuals in the United States right now are more likely to develop concurrent chronic health conditions than people with no disabilities, but less likely to receive preventive healthcare and screenings (Reichard et al., 2011). On the one hand, understanding the societal causes of divergence in life expectancy might offer insights into the cultural and institutional determinants of life quality for disabled people today. On the other hand, it will shed light on the historical causes of different approaches to disability in our societies.

In this project, we aim to uncover the causal effect of culture on disabled individuals' life expectancy throughout the XXth century. So far, the literature on the life expectancy of disabled individuals provided associational results (for a review, see Thomas and Barnes, 2010): we contribute by investigating the causal mechanisms behind their lower life expectancy, and by focusing on cultural drivers rather than medical ones.<sup>2</sup> In particular, we will investigate the role of collectivistic cultural traits, which we expect to support disabled individuals and their families in the absence of structured welfare services. To do so, we will rely on parish registers covering the population of northern Sweden and follow disabled individuals and their entire communities at the micro level from the late XIXth century and into the XXth: these individuals were born and raised before the emergence of the Swedish welfare state, which occurred from the 1960s. To identify the causal effect of culture, we exploit a quasi-experiment related to migrations. Sweden experienced massive outflows of migrants from the second half of the XIXth century until the 1920s, and recent evidence from economic history shows that they caused a change in culture, since the people with less collectivistic traits were also more likely to emigrate (Knudsen, 2019; Bazzi et al., 2020). Different localities started experiencing emigration at different times, but in 1913, the United States introduced more restrictive immigration laws which strongly limited the outflow of emigrants from

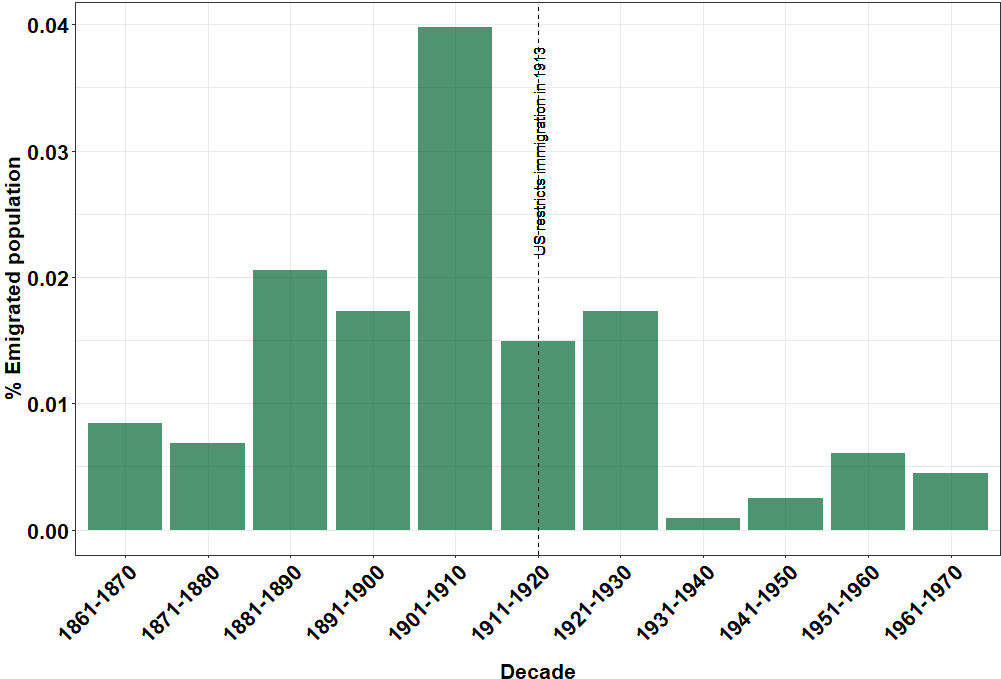
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<sup>1</sup>These findings are obtained from the same dataset we plan to employ in this paper.

<sup>2</sup>For Sweden, see Junkka et al. (2021) for a longitudinal analysis from the XIXth century to present.

Sweden. The result is exogenous variations in the intensity of emigration at the local level, which directly translated into changes from more individualistic to collectivistic cultural traits: localities that experienced large migration outflows display more collectivistic traits. Therefore, by comparing the life expectancy of disabled people after 1913 and using migration outflows as our treatment variable, we identify the effect of collectivism. We then corroborate this identification strategy by relying on data that measure collectivism more directly: parish-level participation in voluntary charity associations between the end of the XIXth and the beginning of the XXth century. We expect to find that disabled individuals from more collectivistic societies have lived longer lives: access to social ties is associated with improved health and life outcomes for disabled people in both historical (e.g., for deafness [De Veirman, 2015](#)) and contemporary settings ([Mithen et al., 2015](#)).

**Figure I:** Emigration from northern Sweden over the XXth century



Notes: the figure shows the percentage of the population that emigrated in each decade from Västerbottens County, where the parishes in our sample are located. The vertical line indicates the decade in which the United States restricted immigration flows. Data are from [Statistics Sweden \(1969\)](#). The report also indicates that during the entire period, 87% of all emigrants settled in the United States.

## 2 Data and empirical strategy

For our analyses, we will exploit rich historical individual data from the POPLINK database, curated by the Centre for Demographic and Ageing Research at Umeå University. POPLINK contains high-frequency observations for 506,751 individuals in Västerbottens County between 1688 and 1960. The data, extracted from the registries of 19 parishes, allows us to observe each person’s civil status, migration choices (both within and outside Sweden), occupation, and role within the family. It is also possible to link each person to their household, therefore linking different individuals.

**Measuring collectivism** Our collectivism treatment variable is measured before the United States restricted immigration flows in 1913, since it relates directly to the intensity of emigration before 1913. We adopt several measure of emigration-based collectivism: (i) At the parish level, we are able to measure the percentage of the population that emigrated before 1913, averaging across years, and distinguishing between domestic and international migrations; (ii) The same measures can be observed at the individual level, reconstructing the presence of emigrants in the families of disabled individuals; (iii) At the municipal level, from historical census data. To corroborate the nexus between emigration and collectivism, we will also rely on a more direct measure of collectivism: the percentage of people in each parish who participated in charitable associations.

**Measuring disability** In our analyses, we focus on disabled individuals born after 1913, that is once the immigration reform in the US limited the outflow of emigrants from Sweden and hence the consequent cultural changes. In POPLINK, disability is recorded following the historical definition, namely an impairment that, while present since childhood, prevents individuals from working and sustaining themselves when adults. Therefore, we are able to code a binary variable for disability, observed for each individual between ages 15 and 24 (Vikström et al., 2021; Haage et al., 2016). Moreover, following medical guidelines from the time, they often annotated the type of impairment, distinguishing among sensory, intellectual or physical disabilities. Intellectual disability (referred to as “feble-mindedness”) was considered separately from psychiatric disorders which arose after childhood. We follow disabled individuals born after 1913, i.e., after the level of collectivism in their parish has been affected by migrations.

**Measuring life expectancy** To follow individuals until death, for those who died after 1959, we merge the POPLINK dataset with more modern administrative data held by Statistics Sweden. We can measure life expectancy in two ways. First, we can observe age at death restricting to the subsample of disabled individuals. Second, to have a measure that compares disabled and non-disabled individuals, we can rely on excess Life-Years Lost (LYL) (Andersen, 2017). LYL captures the difference in life expectancy between individuals with and without disabilities. The expected life length for the two groups is obtained by estimating a survival function on a population of synthetic individuals who have a similar covariates distribution to the sample. The difference in means from the two groups is then the LYL, an estimate of years of life lost due to disability after subtracting the confounding effect of covariates.

**Proposed models** Given the setup, we estimate the following models and obtain causal identification:

$$\text{Age at death (post 1913)}_i = \alpha_i + \beta \text{Collectivism (pre 1913)}_{ip} + \mathbf{X}_i + \varepsilon_i$$

Where  $i$  denotes disabled individuals and  $p$  denotes their parish: collectivism can be measured with migration at the parish level or in the family of individual  $i$ .  $\mathbf{X}_i$  is a set of individual-level covariates including the family composition and socio-economic status, location, and period of observation. Since all disabled individuals in the dataset have died and the dependent variable is age at death measured on a continuous scale, a linear specification suffices in this case: there is no censoring or need to estimate spells.

This linear model will be complemented by Cox hazard models for both disabled and non-disabled individuals -survival functions are needed to estimate the LYL. Both models will be estimated with all alternative measures of collectivism and, in addition, we will also show the association between migration-based measures of collectivism and the percentage of the population in a charitable association.

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