Advances in Life Course Research 19 (2014) 1–13

Contents lists available at ScienceDirect

Advances in Life Course Research

journal homepage: www.elsevier.com/locate/alcr

Age and socioeconomic inequalities in health: Examining the role of lifestyle choices

Arnstein Øvrum [a,b,*], Geir Wæhler Gustavsen [a], Kyrre Rickertsen [a,b]

[a] Norwegian Agricultural Economics Research Institute, P.O. Box 8024 Dep, NO-0030 Oslo, Norway
[b] UMB School of Economics and Business, Norwegian University of Life Sciences, P.O. Box 5003, NO-1432 Ås, Norway

ARTICLE INFO

Article history:
Received 27 June 2013
Received in revised form 24 October 2013
Accepted 31 October 2013

Keywords:
Socioeconomic status
Inequality
Life course
Lifestyles
Health
Norway

ABSTRACT

The role of lifestyle choices in explaining how socioeconomic inequalities in health vary with age has received little attention. This study explores how the income and education gradients in both important lifestyle choices and self-assessed health (SAH) vary with age. Repeated cross-sectional data from Norway (n = 25,016) and logistic regression models are used to track the income and education gradients in physical activity, smoking, consumption of fruit and vegetables and SAH over the age range 25–79 years. The education gradient in smoking, the income gradient in consumption of fruit and vegetables and the education gradient in physical activity among males become smaller at older ages. Physical activity among females is the only lifestyle indicator in which the income and education gradients grow stronger at older ages. In conclusion, this study shows that income and education gradients in lifestyle choices may not remain constant, but vary with age, and such variation could be important in explaining corresponding age patterns of inequality in health.

1. Introduction

A large and growing body of literature seeks to improve our understanding of why indicators of socioeconomic status and health are so strongly associated (Cutler, Lleras-Muney, & Vogl, 2011; Marmot, Friel, Bell, Houweling, & Taylor, 2008). Acknowledging the dynamic nature of health production, this literature has partly focused on how socioeconomic inequalities in health evolve over the adult life course. The current empirical evidence on this important issue is mixed, in part because different indicators of socioeconomic status and health have been investigated (Kim & Durden, 2007). However, three main patterns of results stand out.

In some studies, health differences by socioeconomic status are found to be increasing in age throughout the adult life course (Benzeval, Green, & Leyland, 2011; Kim & Durden, 2007; Ross & Wu, 1996; Wilson, Shuey, & Elder, 2007). Such results correspond with the cumulative advantage hypothesis. This hypothesis asserts that throughout the adult life course, socioeconomic status is closely associated with our daily investments into the production of poor and good health. Gradually, these investments result in a relatively more rapid deterioration of health among lower than higher socioeconomic status groups.

In other studies, health differences by socioeconomic status are found to be increasing in age until late midlife, or pre-retirement (50–60 years of age), after which they level off or begin to decrease (Beckett, 2000; Huijts, Eikemo, & Skalická, 2010; van Kippersluis, O'Donnell, van Doorslaer, & van Ourti, 2010). Such results are in line with the cumulative advantage hypothesis until late midlife, but with an age-as-leveler hypothesis thereafter. More particularly, biological factors become increasingly important

* Corresponding author at: Norwegian Agricultural Economics Research Institute, P.O. Box 8024. Dep, N-0030 Oslo, Norway. Tel.: +47 22367200; fax: +47 22367299.
E-mail addresses: arnstein.ovrum@nilf.no (A. Øvrum), geir.gustavsen@nilf.no (G.W. Gustavsen), kyrre.rickertsen@umb.no (K. Rickertsen).

1040-2608/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.alcr.2013.10.002

with older age in determining health, thus downplaying the role of socioeconomic status (Herd, 2006). Also other factors have been found to contribute to age-as-leveler effects in health. These factors include the effects of mortality selection (Kim & Durden, 2007), cohort effects (Lynch, 2003) and labor market participation status (Case & Deaton, 2005; van Kippersluis et al., 2010).

Finally, some studies have found that, for selected health and socioeconomic status indicators, health differences by socioeconomic status do not vary significantly with age (Beckett, 2000; Kim & Durden, 2007). We refer to such patterns of results as being in line with the persistent health inequality hypothesis (Ferraro & Farmer, 1996).

To the best of our knowledge, no studies have yet explicitly examined the potential role of healthy lifestyle choices in explaining these competing hypotheses for the dynamics of socioeconomic inequalities in health. This is surprising for at least three reasons. First, there is convincing evidence for the protective effect of certain lifestyle choices, including physical activity, not smoking and consumption of fruit and vegetables, against adverse health outcomes such as type 2 diabetes, cardiovascular disease and certain types of cancer (Gandini et al., 2008; He, Nowson, Lucas, & MacGregor, 2007; Jeon, Lokken, Hu, & Van Dam, 2007; Sofi, Capalbo, Cesari, Abbate, & Gensini, 2008; World Health Organization, 2003). Second, similar to most health outcomes, the probability of making healthy lifestyle choices is closely associated with socioeconomic status indicators such as education and income (Cutler & Lleras-Muney, 2010; Pampel, Krueger, & Denney, 2010). Third, the effects of healthy lifestyle choices on the incidence of adverse health outcomes are often characterized by cumulative, long-processes (Kuh & Shlomo, 2004), which highlights the importance of taking a life course perspective with respect to the dynamic relationship between socioeconomic status, lifestyle choices and health.

As noted, we often implicitly assume that lifestyle choices differ systematically by socioeconomic status and thereby contribute to patterns of cumulative advantage effects in health. This is a reasonable assumption to the extent that the socioeconomic gradients in lifestyle choices remain stable or increase over the adult life course. But what if the socioeconomic gradients in lifestyle choices become smaller with older age? For example, people of lower socioeconomic status may grow more health conscious and thus engage in healthier lifestyles when they reach late midlife and realize that good health investments are important for longevity.

We use repeated cross-sectional data from Norway from 1997 to 2011 to explore how the income and education gradients in both important lifestyle choices and SAH vary with age. Repeated cross-sectional data are often referred to as pseudo-panel data because although not tracking the same individuals as they age, such data allow for tracking the average age patterns for groups of individuals as they age while controlling for possibly confounding cohort and period effects (Deaton, 1997). However, note that our study is not a pure 'life course' study in the sense that we do not follow the same individuals as they age.

Our lifestyle indicators are physical activity, smoking and consumption of fruit and vegetables. We use these lifestyle indicators because they are different in nature and because of their close association with both socioeconomic status indicators and the risk of major health outcomes, as described above. Our research questions are as follows. First, to what extent are the observed age patterns of inequality in lifestyle choices consistent with (i) the age-as-leveler, (ii) the persistent health inequality, and (iii) the cumulative advantage hypothesis in health? Second, to what extent do age patterns of inequality vary across different lifestyle choices, education and income, and gender?

2. Methods

2.1. Data source

The Norwegian Monitor Survey is a nationally representative and repeated cross-sectional survey of adults aged 15–95 years. The survey has been conducted every second year since 1985 and is one of Norway's most comprehensive consumer and opinion surveys. The institution behind the survey (Ipsos Norway) recruits respondents through a short telephone interview, and those who accept to participate receive a paper-based questionnaire by mail. Ethical approval was not required for this research; we represent a third party user of the data in question, and we only have access to a data file that contains anonymous data, i.e., we do not have access to any information that can be used to identify specific individuals.

The question about SAH was not included in the survey before 1997, and therefore data from 1997 to 2011 are used. For two reasons, only respondents between the ages of 25 and 79 years were included. First, we want to study individuals who have completed most of their education and started earning their own income. Second, the sample includes relatively few respondents between the ages of 80 and 95 years. After deleting observations with missing information for any of the variables included in this study (3066 observations), we obtain our sample of 25,016 observations. Based on statistical tests comparing group means, the deleted respondents were on average significantly older, more likely female, less educated and had lower incomes than the respondents that are included in the sample.

2.2. Outcome variables

The survey questions related to physical activity, smoking, consumption of fruit and vegetables and SAH are based on various types of categorical scales. The respondents were asked to indicate their frequency of intake for nine different fruit and vegetables on the following scale; "daily"; "3–5 times per week"; "1–2 times per week"; "2–3 times per month"; "about once per month"; "3–11 times per year"; "rarer"; or "never". Similarly, physical activity has an 8-point frequency scale ranging from "never" to "once or more per day". The respondents also indicated if they smoked tobacco "daily", "sometimes" or "never" at the time of the survey, whereas