YOUNG AND OLD

Perceptions of older people in the media: how ageist is the *Economist*?
See p 1433

The association of early IQ and education with mortality: 65 year longitudinal study in Malmö, Sweden

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STUDY QUESTIONS Can differences in early IQ explain why people with longer education live longer, or do differences in father's or own educational attainment explain why people with higher early IQ live longer?

SUMMARY ANSWERS Mortality differences among participants by own educational attainment were not explained by early IQ, and mortality differences by own early IQ were not explained by father's education or one's own educational attainment, but the effect of early IQ on mortality differed between men and women.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Both intelligence and educational attainment are linked to disease, but the causal interplay between these associations is not yet understood. This analysis suggests that both factors are important. Furthermore, the clear difference in the effect of IQ between men and women suggests that IQ is linked with mortality in ways that involve the social and physical environment rather than simply being a marker of a healthy body to begin with. Cognitive skills should, therefore, be addressed in our efforts to create childhood environments that promote health.

Participants and setting

This population based study assessed schoolchildren in Malmö, Sweden.

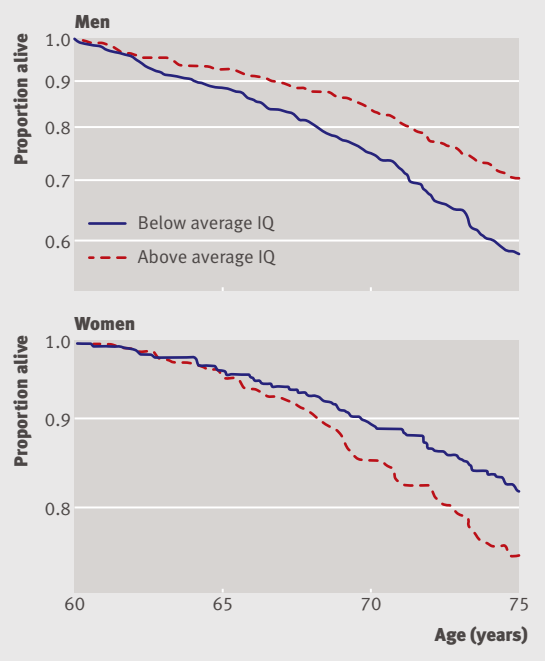
Design, size, and duration

A total of 1530 schoolchildren took IQ tests in 1938 at the age 10. These data were linked through personal identity numbers to the Swedish causes of death register up until 31 December 2003, when the participants were aged 75 years. Mortality risks were estimated with Cox proportional hazards regressions.

Main results and the role of chance

For both sexes, own educational attainment was clearly associated with survival, even beyond the importance of early IQ. Each additional year in school was associated with a reduced risk of dying when early IQ and father's education were adjusted for (hazard ratio (HR) for each additional year in school 0.91 (95% CI 0.85 to 0.97) for men and HR 0.88 (95% CI 0.78 to 0.98) for women). Higher early IQ was linked with a reduced mortality risk in men, even when own educational attainment and father's education were adjusted for (HR for one standard deviation increase in IQ 0.85 (95% CI 0.75 to 0.96)). In contrast, there was no crude effect of early IQ on mortality for women, and women with above average IQ had an increased mortality risk when own educational attainment was adjusted for, but only after the age of 60 (HR 1.60 (95% CI 1.06 to 2.42); figure).

SURVIVAL FROM AGE 60 YEARS BY SEX AND COGNITIVE ABILITY, ADJUSTED FOR OWN EDUCATIONAL ATTAINMENT



Bias, confounding, and other reasons for caution

The figure should be interpreted with some caution because it pertains to subgroups. In addition, the analyses in this paper did not include the possible role of changes in IQ.

Generalisability to other populations

The participants in our study are from only one city; however, the study data come from a near total census of that city, namely almost all children in the third grade of school. Changes in children's living conditions during the long follow-up period may affect whether our results can be generalised to today's children. Sweden's economic conditions in the 1930s were comparable to those in middle income countries today.

Study funding/potential competing interests

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Perceived age as clinically useful biomarker of ageing

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Abstract

Objective To determine whether perceived age correlates with survival and important age related phenotypes.

Design Follow-up study, with survival of twins determined up to January 2008, by which time 675 (37%) had died.

Setting Population based twin cohort in Denmark.

Participants 20 nurses, 10 young men, and 11 older women (assessors); 1826 twins aged ≥70.

Main outcome measures Assessors: perceived age of twins from photographs. Twins: physical and cognitive tests and molecular biomarker of ageing (leucocyte telomere length).

Results For all three groups of assessors, perceived age was significantly associated with survival, even after adjustment for chronological age, sex, and rearing environment. Perceived age was still significantly associated with survival after further adjustment for physical and cognitive functioning. The likelihood that the older looking twin of the pair died first increased with increasing discordance in perceived age within the twin pair—that is, the bigger the difference in perceived age within the pair, the more likely that the older looking twin died first. Twin analyses suggested that common genetic factors influence both perceived age and survival. Perceived age, controlled for chronological age and sex, also correlated significantly with physical and cognitive functioning as well as with leucocyte telomere length.

Conclusion Perceived age—which is widely used by clinicians as a general indication of a patient's health—is a robust biomarker of ageing that predicts survival among those aged ≥70 and correlates with important functional and molecular ageing phenotypes.

Introduction

Perceived age—usually the estimated age of a person—is an integral part of assessment of patients.[1 2] It is influenced negatively by exposure to sun, smoking, and low body mass index (BMI) and positively by high social status, low depression score, and being married, though the strength of the associations varies by sex.[3]

We looked at age as perceived by geriatric nurses (who should be "experts" in evaluating the appearance of older people), older women (who could also be "experts"), and young male student teachers (who were expected to be the worst assessors). We also examined whether perceived age was correlated with physical and cognitive function and leucocyte telomere length in the older twins and whether the age, sex, and background of the assessors affected the results.

Methods

Study population

The Longitudinal Study of Aging Danish Twins (LSADT) follows a population based cohort of same sex twins aged ≥70.[4] The study began in 1995, with assessments every two years up to 2005. In 2001 the study had a participation rate of 85%; and 91% of the participants with normal cognition, aged 70-99, agreed to have their face photographed. A total of 1826 twins (840 men and 986 women) had a passport type photograph taken (fig 1). We used the Danish Civil Registration system, which registers date of death or emigration, to follow each participant from the date in 2001 when their photograph was taken to 31 January 2008. For further methods on assessing perceived age, physical functioning, telomere length, and analyses see bmj.com.

Fig 1 | Composite pictures each representing average appearance of groups of 10 twins aged 70 (range 69-71). Left hand image represents twins who looked younger for their age (average perceived age 64, range 57-69) than those represented by right hand image (average perceived age 74, range 70-78)

Results

All three assessor groups rated 387 twin pairs (774 twins, 352 men and 422 women), corresponding to 175 monozygotic and 212 dizygotic twin pairs. Analysis of variance showed that the perceived age data from all three assessor groups had high reliability (0.82-0.94).

Characteristics for age and sex specific thirds of perceived age for the full sample of 1826 pictures rated by the 10 nurses were consistent across all age and sex strata, with higher mortality and poorer functioning in the higher perceived age thirds. See bmj.com. The table on bmj.com shows comparisons of data generated by all assessor groups.

The mean of the perceived ages was close to the mean of the chronological ages; within one year in all rater groups except the older assessors, who overestimated the ages by an average of 1.7 years. The mean chronological age was about two years higher in the total sample of 1826 twins than among the 387 twin pairs (774 individuals). The correlation between perceived age and chronological age was highest in the total sample (0.52), while it was lowest (0.22), but still significant, using data from the older female assessors.

Ageing phenotypes

Perceived age was significantly correlated with all functional phenotypes across all assessor groups and in both the twin

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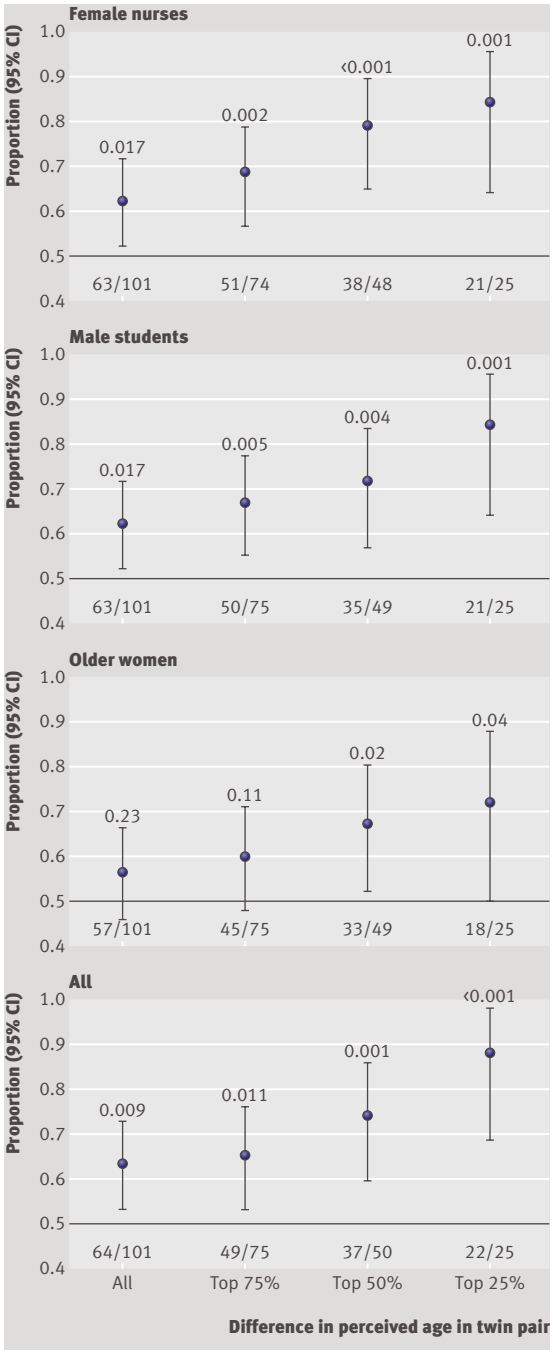

Fig 2 | Comparison within pairs of dizygotic twins, showing proportions of pairs in which older looking twin died first. P values are two sided for standard binomial test. Numbers above x axis indicate absolute number of pairs in which older looking twin died first divided by total number of pairs

pair sample and the total sample. All tested indices of ageing were associated with increased perceived age in the expected direction.

Survival analysis

At the end of follow-up, among the 387 twin pairs (352 men and 422 women), 225 (29%) had died, 116 (33%) men and 109 (26%) women. In the total sample of 1826 twins, 348 (41%) men and 327 (33%) women had died. For all the assessor groups, perceived age was highly and significantly correlated to mortality in the bivariate analyses and also highly and significantly correlated after adjustment for chronological age. The effect size for perceived age was the same as or larger than chronological age, both in the univariate and the bivariate analyses. See bmj.com.

Perceived age was still significantly associated with survival after adjustment for other biomarkers of ageing. The effect size in the full sample, however, was attenuated from a hazard ratio of 1.08 (1.05 to 1.10) when we adjusted for chronological age and sex to 1.05 (1.03 to 1.07) when we added MMSE and grip strength and finally to 1.03 (1.01 to 1.06) when we also included strength score and cognitive score in the model together with all the previous covariates.

As of 31 January 2008, there were 179 pairs (78 monozygotic and 101 dizygotic) in which at least one twin had died. Figure 2 shows that for the dizygotic twin pairs the likelihood that the older looking twin of the pair died first increased markedly with increasing difference in perceived age within the pair—that is, the bigger the difference in perceived age within the pair, the more likely it was that the older looking twin died first. There was a significant increasing linear trend for all assessor groups (P=0.001 for nurse assessors, P=0.021 for student assessors, P=0.03 for older assessors) and all assessors combined (P=0.02). There was no such association for monozygotic twins.

Discussion

Perceived age predicts survival among people aged ≥70, even after adjustment for chronological age, sex, and other readily measurable biomarkers of ageing. Perceived age also correlates with age related phenotypes such as physical and cognitive functioning and leucocyte telomere length. We have shown that perceived age based on facial photographs is a robust biomarker of ageing that does not depend on the sex, age, and professional background of the assessors.

We found common genetic factors influencing both perceived age and survival because controlling for genetic factors (the comparison within monozygotic pairs) removed the association between perceived age and survival. Genetic factors that, for example, influence the condition of cardiovascular tissue could affect the risk of myocardial infarction as well as the appearance of skin.[9]

For strengths and weaknesses of this study see bmj.com. When assessing health, physicians traditionally compare perceived and chronological age, and for adult patients the expression "looking old for your age" is an indicator of poor health. Our study indicates that this practice, which has existed for decades if not centuries,[10] is actually a useful clinical approach especially given that in a clinical setting perceived age is based on an array of indicators in addition to facial appearance. A basic clinical tool such as perceived age is a useful biomarker of ageing, and facial photographs are, currently, likely to be more informative with regard to survival of older people than a DNA sample.

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Retrospective analysis of attitudes to ageing in the *Economist*: apocalyptic demography for opinion formers?

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Abstract

Objective To investigate the description of older people and ageing in a major weekly newspaper, influential in political and financial circles, to see whether it reflected ageing in a balanced manner, and to what extent it indulged in apocalyptic demography—the portrayal of population ageing as a financial burden rather than a scientific advance.

Design Electronic search of the digital archive of the *Economist* of articles published between January 1997 and April 2008.

Main outcomes measures Categorisation of articles as portraying population ageing as a burden or a benefit or with a balanced view.

Results Of 6306 identified articles, 262 were relevant. Most featured pensions, demography, and politics. Of these 262, 64% portrayed population ageing as a burden and 12% as a benefit; 24% had a balanced view. Most articles therefore showed a predominantly ageist view of older people as a burden on society, often portraying them as frail non-contributors. Recurrent themes included pension and demographic "time bombs" and future unsustainable costs of health care for older people.

Conclusion This negative view of older people might be influential in shaping the attitudes of readers, who include opinion formers in political and economic circles. Gerontologists (including geriatricians) need to engage with influential media, as well as helping to promote a professional development of journalists that is informed and knowledgeable about the negative impact of ageism on the wellbeing of older people.

Introduction

Ageism is the discrimination against, contempt for, abuse, stereotyping, and avoidance of older people. Apocalyptic demography is a flawed concept that predicts disproportionate burdens arising from population ageing,[1-3] This alarmist attitude fails to recognise the many benefits of ageing and concentrates on the negative attributes of ageing.

Official discourse on older people is often coloured by apocalyptic demography.[1] Among the contributors to this misinterpretation are over-reliance on highly variable demographic forecasts,[3] misapplication of dependency concept, homogenisation of populations of older people, failure to count in reductions in child and education spending, and failure to incorporate scientific findings showing little extra impact from population ageing on health care.[4]

Tackling apocalyptic demography should concentrate on opinion formers, politicians, and in particular economists. We analysed articles in the *Economist*, a weekly magazine that has a uniquely powerful global readership, with 46% in senior management, 20% who have lobbied or advised government, and 28% who hold a position in a social or community organisation (http://theideaspeople.economist.com). This influence is even more marked in government circles, reaching 45% of opinion formers in US federal government and rising to 56% of opinion leaders in the congressional branch of the executive. We hypothesised that the perspective on ageing of this influential newspaper might be unbalanced, thus perpetuating apocalyptic demography and ageism at the highest levels of society.

Table 1 | Principal theme of articles on ageing in the *Economist*

Categories	No of articles
Pensions	78
Demography	34
Ageing population	34
Politics	33
Health care	24
Retirement	20
Biology of ageing	12
Long term care of elderly	9
Centenarians	3
Euthanasia	2
Miscellaneous	13

Methods

Using the online digital archive of the *Economist* (from January 1997 to the present day) in May 2008 we performed a search for the following five search terms: "older" or "elderly" or "pensions" or "retirement" or "long term care."

Two observers independently read and analysed articles. Those considered relevant had at least one comment on older people. We assessed article content for stigmatisation of older people on account of their age or ageing. We classified articles as to whether they portrayed population ageing as predominantly a burden or a benefit or took a balanced view with positive, negative, and neutral comments in balanced proportions depending on the language they contained. We

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WHAT IS ALREADY KNOWN ON THIS TOPIC

Ageism is common in both society and health care

Service provision in health care is coloured by popular discourse and narrative

Such prejudices need to be recognised to be addressed, and ageism has not yet been examined in the economics literature

WHAT THIS STUDY ADDS

There is a significant trend to ageism in one of the most influential economic and political magazines in the world

Geriatricians and gerontologists who want to influence policy makers to improve services for older people will need to engage in a dialogue with journalists in areas other than the biomedical literature

Table 2 | Content analysis of articles relating to ageing

	Positive	Balanced	Negative
Pensions	1	21	56
Ageing population	4	5	25
Demography	4	4	26
Politics	5	6	22
Health care	0	6	18
Retirement	5	8	7
Biology of ageing	3	6	3
Long term care	0	4	5
Centenarians	2	0	1
Euthanasia	0	1	1
Marketing	1	1	0
Wealthy Germans	0	1	0
Age discrimination	1	0	0
Suicide in Korea	0	0	1
Productivity	0	0	1
Technology and older people	1	0	0
Exercise and older people	1	0	0
Gadgets for elderly	1	0	0
Grandparents raising grandchildren	1	0	0
Funeral homes	0	0	1
Old musicians	0	0	1
Art	1	0	0

have previously used this approach in media studies on attitudes to older people.[5] Disagreements were resolved by a third reviewer and consensus.

Results

The search yielded 6306 articles, of which 262 were considered relevant. The articles included 78 on pensions, 34 on demography, 34 on the ageing population, 33 on politics, 24 on health care, 20 on retirement, 12 on the biology of ageing, nine on long term care facilities, and the remainder on a range of other issues.

The raters agreed on 256 articles, with recourse to third party adjudication on six. We found 168 articles portrayed population ageing as a burden, 63 articles portrayed a balanced view, and 31 portrayed it as a benefit. The box shows some quotes from the articles.

Content analysis showed that the topics that tend to depict population ageing in the most negative light include those on pensions and demography. Despite the fact that our study was based on a 10 year period, analysis did not show a shift in attitudes over time. The numbers of articles portraying older people in a negative or positive light were comparable between 1997 and 2008.

Discussion

We found that nearly two thirds of the relevant articles portrayed older people in a negative light, effectively as a burden to society. The subject matter in three quarters of the articles involved pensions, demography, health care, and politics; and the theme of apocalyptic demography was widespread. Older people were often portrayed as frail non-contributors to society. The alarmist words "time bomb" were commonly used in relation to demography and pensions.

That the *Economist*, a highly influential economic newspaper that prides itself on being "an enemy of privilege, pomposity and predictability," should have such a predominantly negative view of older people, mirroring that found in the popular media and advertisements, is surprising. Given the influence of the newspaper—*Time* magazine describes it as "exerting an influence far beyond its circulation . . . its calm authoritativeness has made it a favorite of political and business leaders in the US as well as Britain"—the message it portrays affects not just its readers but a wider population. It would seem unconscionable that the newspaper would be openly racist or sexist, and use such dismissive descriptors for these groups, yet older people do not seem to be accorded the same degree of courtesy and critical thought.

Journalists, economists, and gerontology

Given the scale and speed of demographic change of the past 50 years, journalists and economists (and indeed all involved in the formulation and debate of public policy) need to be educated in a more comprehensive overview of ageing. A similar process has been reasonably well studied for racism in journalism,[6] with positive experiences with media literacy training that reduce stereotype activation.

For economists, the challenge is more daunting, with not only powerful vested interests in the pensions industry but also deeply held beliefs about the "dependency" of older people, despite convincing arguments to the contrary. The

Positive quotes

Age cannot wither them (16 April 1998)

Grandparents are now raising an awful lot of America's poorest and most troubled children (Skipping a generation, 14 June 2007)

The new demographics that are causing populations to age and to shrink are something to celebrate (Incredible shrinking countries, 5 January 2006)

Politicians may fear the decline of their nations' economic prowess, but people should celebrate the new demographics as heralding a golden age (Incredible shrinking countries, 5 January 2006)

The old are wealthier and healthier than ever (Over 60 and overlooked, 8 August 2002)

Negative quotes

The older they get, the more they cost (23 September 2004)

Fewer and wrinklier Europeans (13 January 2000)

They waddle slowly through the shopping malls; drive with exaggerated care on the freeways; fumble with their change at the check-out tills (Venerable elders, 22 July 1999)

After years of warnings about the "demographic time bomb" due to detonate some time around 2020 (All-clear? 13 April 2000)

Given that they all agree that a demographic "pension time-bomb" is ticking, Europe's policymakers have done remarkably little to defuse it (Old hopes stirring, 12 October 2000)

Wrinklies (Fewer and wrinklier Europeans, 13 January 2000)

Weary crumblies (Who wants to live forever? 21 December 2000)

Granny farming (27 November 1997)

At what point does an ageing mind become a liability and not an asset? (Wisdom or senility, 16 February 2006)

relation between longevity and economic growth, however, is complex,[7] with some linking increased longevity with economic growth—the "demographic dividend."[8] One calculation of this dividend is that cumulative gains in life expectancy after 1900 were worth over $1.2m to the representative American in 2000, whereas gains after 1970 added about $3.2 trillion a year to national wealth, equal to about half of gross domestic product.[9]

Fortunately, some international forums have understood the need to bring economists, politicians, and gerontologists together (as well as journalists), and the World Demographic Association meetings have helped to bring about a focus on the positive as well as the negative aspects of ageing.[10] Others point out that ageism can be turned around by the same sort of methods that have been successful in reducing racism and sexism—education, persuasion, protest, organisation, legislation, civil suits—and by the personal examples of "successful ageing" that challenge negative stereotypes.[11]

In defence of the *Economist*, the letters page shows a small but increasing volume of dissent to its ageist positions. In 2008 it ran a webcast from Robert Butler on whether John McCain was too old to run for the presidency (which emphasised that the presidential candidate's age was not relevant).

The strengths of our study include the large time span over which the articles were produced (11 years) and the wide search terms, leading to over 6000 articles being analysed. The use of Goffman's stigmatisation concept led to a high level of reliability between observers; only six of 262 articles required a third independent review.

The weaknesses include a possible expectation of bias against older people, given that the senior author had previously analysed and described negative attitudes in the popular press to older drivers and stroke.[5] We had agreed, however, to prepare this paper on the basis of the results, regardless of the outcome. There is also some chance of missed relevant articles because of the necessary constraints of our search terms. The broad range and high number and range of articles read, however, give us some reassurance in our results.

This study is not an attack on the *Economist*, but rather a manifestation of how deeply ingrained negative stereotypes and prejudices about ageing are in an influential magazine. We hope to stimulate reflection and discussion among journalists and economists on one of the most extraordinary social changes of the past century—our increased longevity.

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Data sharing: No additional data available.

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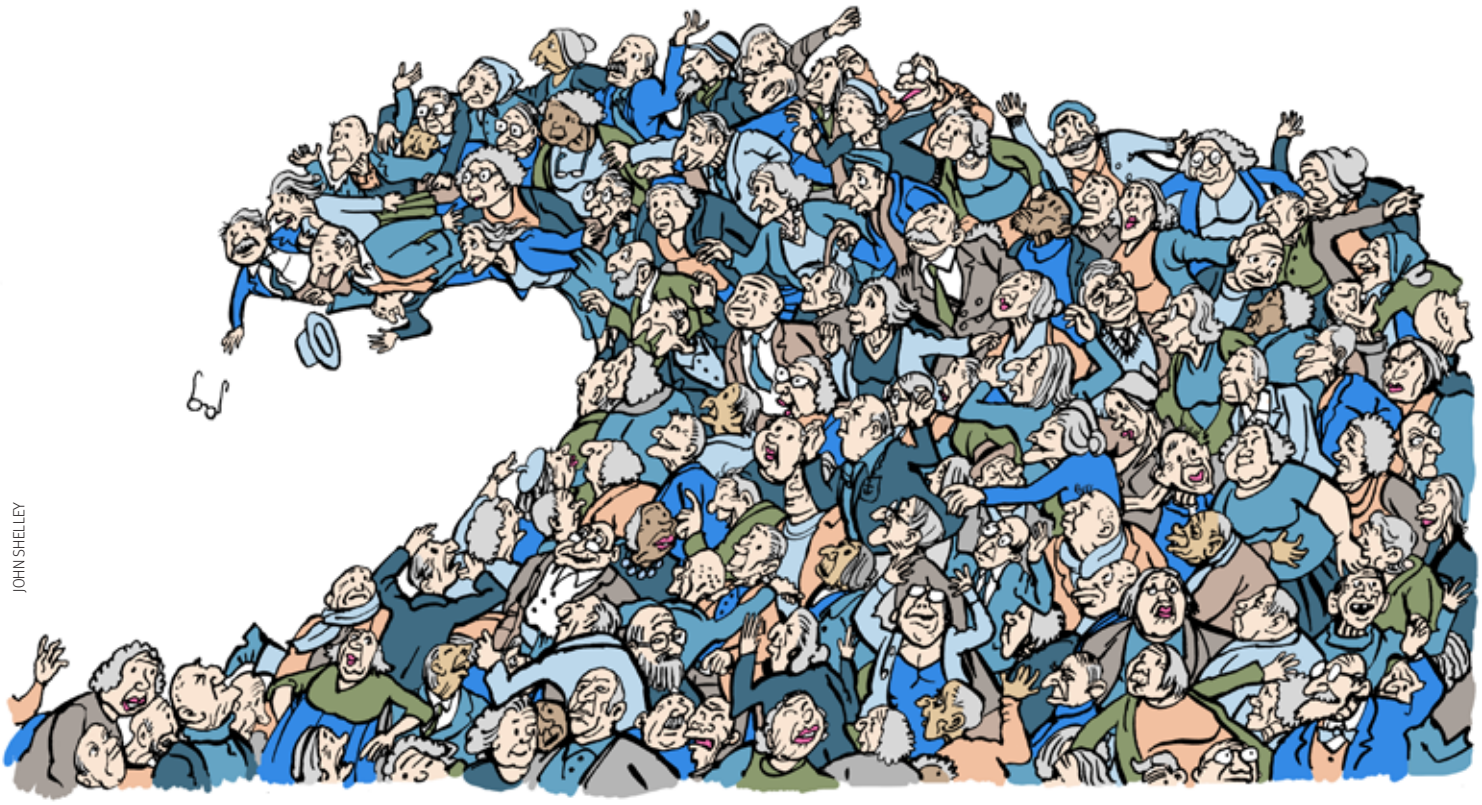

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