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HOW TO INCLUDE THE SOCIAL FACTOR IN DETERMINING FRAILTY?

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It is nowadays clear that health inequities arising from the societal conditions in which people are born, grow, live, work and age, are social determinants of health. These include early years' experiences, education, economic status, employment and work conditions, housing and environment, and access to effective systems of preventing and treating ill health. Increasingly, research on the determinants of adult and old-age health is recognizing the need to incorporate earlier life circumstances. The dearth of available longitudinal, nationally representative data with extensive information on socioeconomic status and health status gives us an opportunity to understand how early, middle, and late life factors influence the life cycle trajectory of health and thus of frailty.

Social factors as determinants of frailty status

Life course perspective. A number of studies have reported associations between socio-economic status (SES) and health in adulthood and old age with consistent evidence that the socio-economically disadvantaged have higher chronic disease and mortality rates. Evidence also indicates that socio-economic disadvantage in childhood is associated with a range of adverse outcomes in adulthood often independent of adult SES. Childhood SES, through its association with a range of factors, including growth and early life nutrition, may influence the peak level of physical capability attained in early adulthood, thereby affecting levels later in life. Poor adult SES is associated with worse objectively measured physical capability levels; and it has been recently shown that this effect is also seen with childhood SES independent of adult SES¹. Such an association has important implications for interventions aimed to frailty prevention and improving the physical capability levels of older people.

The specific aging experience of some populations, characterized by poverty and poor social conditions along with high co-morbidity and disability and a scarcity of health and social services, has only recently been recognized. Research among Latin American older persons arising from the SABE survey², indicates that a poor material environment during childhood is related to poor physical functioning and mental health and that men's and women's differential exposure and vulnerability to social conditions and biological factors are associated with gender differences in physical function and mental health. It has also been shown in these populations, that life-course social and health conditions are associated with frailty; this link increases our understanding about the social origins of frailty.

Social and life-style correlates of frailty. Social factors are now recognized as relevant to understand frailty. However, research into the prevalence of frailty and its correlates, particularly social influences, is still limited. Data from the Hertfordshire Cohort Study, has shown that frailty, defined by the Fried criteria, is partly determined by social inequalities, which seem to be mediated by co-morbidities that occur with greater frequency among socially disadvantaged individuals³. Recent findings in a Mexican cohort support this view⁴. It then seems clear that social factors, often ignored in the medical context, represent risk factors for the development of frailty and therefore should be systematically assessed and taken into account when evaluating an elderly person for multidimensional prevention and treatment programs. A longitudinal approach is needed in order to better describe this

association.

This longitudinal approach has been thoroughly explored in the Health and Retirement Survey (HRS)⁵, where trajectories of frailty as a function of social vulnerability have been explored using the frailty index (FI). Older cohorts exhibit accelerated increases with age in the accumulation of health deficits. More recent cohorts exhibit higher average levels of and rates of increment in the FI than their predecessors do at the same ages. Females, non-whites, and individuals with low education and income exhibit greater degrees of deterioration than their male, white, and high-SES counterparts at any age. Their findings allow concluding that the expression of biological aging and the accumulation of general system damage do not follow the same path under different circumstances within a human population. In fact, individuals' slopes of change with age are highly sensitive to the social conditions in which they are embedded.

Allostatic load as a mediator. There is a growing interest in understanding how the experience of socio-economic status (SES) adversity across the life course may accumulate to negatively affect the functioning of biological regulatory systems important to functioning and health in later adulthood. In this vein, allostatic load (AL) is conceptualized as a cumulative index of wear and tear across multiple physiological systems involved in the body's effort to adapt to internal and external stressors over time. Recent analyses indicate higher AL as a function of greater SES adversity cumulatively across the life course. This association is only modestly attenuated when accounting for a wide array of health status, behavioral and psychosocial factors. Then, AL could be related to an indicator of decreased reserve such as frailty. In fact, higher baseline value for the allostatic load score has been found associated with greater likelihood of frailty in two recent surveys. In the MacArthur successful aging study⁶, high levels of AL, was associated with a greater likelihood of frailty development over a 3-year follow-up in a sample of initially high-functioning older adults. In the Women's Health and aging studies, regression models showed that a unit increase in the AL score was associated with increasing levels of frailty controlling for race, age, education, smoking status, and co-morbidities⁷.

Social factors as modulators of frailty outcomes

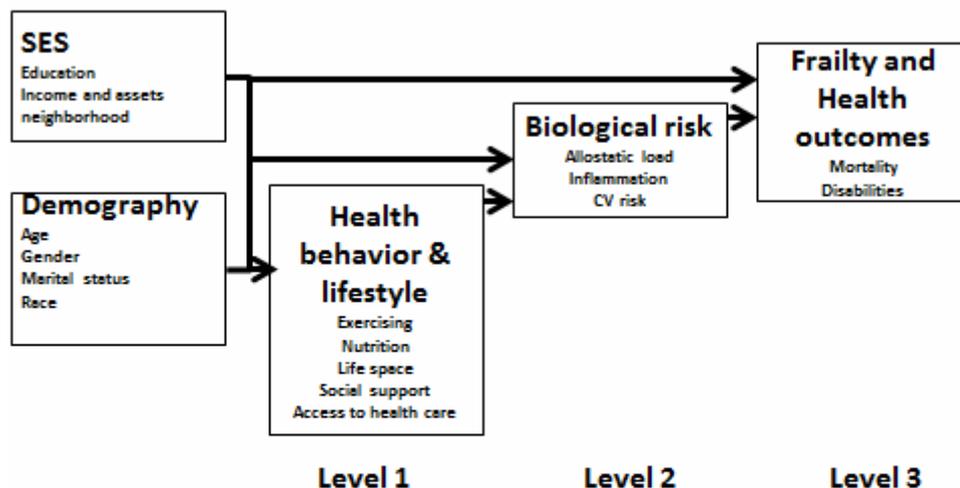
Social vulnerability is related to the health of elderly people, but its measurement and relationship to frailty are controversial. In order to compare social vulnerability and frailty, and to study social vulnerability in relation to mortality Rockwood K⁸ has operationalized social vulnerability with the deficit accumulation approach, showing how it increases with age, women having higher values than men. It also tends to be higher amongst people who are frailer, and it is associated with higher mortality, independent of frailty. This index was shown to be correlated only weakly to frailty; so, while the two may be related, they seem to be distinct, and each contributes independently to mortality. In the Dutch experience⁹, social vulnerability has been approached as "social frailty" and it has been measured through the Tilburg Frailty Indicator on the basis of three criteria: living alone, lack of contacts and lack of support. If someone meets at least two of these three criteria, they are classed as socially frail. Those individuals in this category will not necessarily become physically frail, be admitted to a care or nursing home or die.

The observed relationship between social and physical frailty could strengthen if other indicators of social frailty were used. Research from other sources has shown that health problems can lead to shrinkage of personal networks and withdrawal from social contacts. In the English Longitudinal Aging Study¹⁰, neighborhood deprivation and individual socio-economic status were independently associated with frailty in community dwelling older people. FI scores were highest in those with low SES who also lived in deprived neighborhoods. In a survey in several Hispanic communities in the southern US¹¹, respondents at risk of increasing frailty live in a less ethnically dense Mexican-American neighborhood, are older and have a lower SES. In this population, personal as well as neighborhood characteristics confer protective effects on individual health. Besides a protective environment, engagement in productive activities is also positively associated with health as well as survival of older adults. It has been shown that high-functioning older adults who participate in productive activities are less likely to become frail¹². Another seemingly useful dimension of social functioning is Life Space; defined upon the distance a person routinely travels to perform activities. Determining how far and how often the person leaves his place of residence has been shown useful to predict frailty¹³.

Based on this evidence, the relationship between physical and social frailty may thus be stronger; further research on the different indicators of objective and subjective social frailty could provide more clarity.

The implication for measuring frailty is that social frailty items should be included in the measure, but perhaps should not be given the greatest weight in assessing frailty. Consideration could even be given to starting from a minimum criterion for physical frailty when determining the frailty of an individual, supplemented by social frailty.

Although much work is yet to be done in characterizing social vulnerability, we need to recognize that it plays a role in modulating the adverse outcomes of frailty.



Levels of influence of Socioeconomic status on frailty and its outcomes

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