Is there a Mediterranean migrants mortality paradox in Europe?

From M KHLAT1 and N DARMON2

Sirs—Compared with non-Hispanic Whites, Hispanics in the US are poorer and less educated, and yet they enjoy a lower all-cause mortality rate. This so-called ‘Hispanic Paradox’ has received much attention over the past 20 years, both in the epidemiological and demographic literature. Besides artefactual explanations (i.e. possible under-reporting of Hispanic deaths on death certificates), competing theories fall into two categories: the ‘salmon bias hypothesis’, according to which migrants are likely to return to their country of origin after they retire or become seriously ill, and, the ‘healthy migrant hypothesis’, according to which those who migrate and remain in the host country are

the healthiest and strongest members of their population of origin.

To date, two reviews have documented extensively the wealth of literature on the Hispanic paradox. One, which is very critical of the concept, focuses on low birthweight and infant mortality;1 the other, which is relatively supportive, covers all the different health components involved in the paradox (mortality, infant mortality, violence, AIDS, coronary heart disease, stroke, cancer, and diabetes).2 The first concludes that the evidence supporting the paradox is fragile and highlights the potential role of selective processes in explaining the migrants’ advantage, while the second puts forward the complexity of the picture, with variations by age, gender, type of Hispanic group, degree of acculturation, and specific disease or cause of death.

Recently, a paper—to be considered as a landmark in the field—has very elegantly established that neither the salmon bias, nor the selection of healthy Hispanic migrants into the US

1 Institut National d’Études Démographiques, 133 Bd. Davout, 75980 Paris Cedex 20, France. E-mail: khlat@INED.fr
could explain the mortality advantage of the Hispanics, and
called for further research on cultural factors, especially those
involving favourable health behaviours, to shed more light on
this issue. While much controversy surrounds the very exist-
ence and interpretations of the Hispanic paradox, it has been
argued that investigation of this ‘paradox’ may provide
additional insights into the ways that social factors affect the
health of the population at-large, and that the ‘Hispanic
paradox should be a motivator for further research...’

With this in mind, our purpose is to place the Hispanic
paradox in a wider geographical and cultural perspective, by
pinpointing the remarkable mortality advantage that some
Mediterranean migrant groups enjoy in Germany and France.
While the literature on migrants’ mortality is relatively scarce in
Europe, two methodologically sound studies have provided
quite an unexpected picture. In Germany, analysis of register
data has established that the age-adjusted mortality of the
2 million Turkish residents was consistently half that of the
Germans, and also less than half that of an urban population
in Turkey. The former findings, which concerned males and
females equally, were confirmed by a cohort study (‘German
Socio-Economic Panel’) unlikely to be subject to the inaccuracies
of denominator figures. Convergent features have emerged from
a study based on register and census data in France which high-
lighted the surprisingly low mortality of Moroccan immigrants,
whose number had swollen in the early 1980s to nearly
600 000. Using an indirect demographic method originally
devised to estimate the completeness of vital statistics in developing
countries, the authors have found that the proportion of missing
deaths among Moroccans was about 23% for men, and negligible
for women. After having corrected the numbers of male deaths
accordingly, they found an adjusted life expectancy of 73.7 years
in the 1980s, as opposed to 71.3 in the French population, and
78.8 in females as opposed to 79.6 in the French population.
And yet, the socio-demographic profile of those migrants—they
are frequently illiterate, single, and employed largely as manual
workers (83%)—is expected to favour higher mortality.

Echoing the Hispanic mortality paradox in the US, the above
findings convincingly set the case for a Mediterranean migrants
mortality paradox in some Western European countries, and
have led to a questioning of the classical interpretations prevalent
in the epidemiological and demographic literature. Rather than
referring to a ‘salmon bias’, the authors of the European studies
have wondered about the existence of a ‘mobility bias’ resulting
from an inflation of the denominator base, due to migrants
often returning to their home country for short or long periods,
be it in relation to their health status or not. Indeed, the
Mediterranean countries of Southern Europe and North Africa
are geographically close to France and Germany, and migrants
often return to their home country during holidays or for family
reasons. Individual follow-up such as that implemented in the
German Socio-Economic Panel provides strong support for
the substantive nature of the mortality advantage, as does the
existence of a substantial under-mortality in the Moroccans
study after correction for under-registration of deaths. Possible
explanations are then either the role of selective processes
(‘healthy migrant hypothesis’) or that of health-protective
behaviours.

The ‘healthy migrant hypothesis’ is particularly difficult to
investigate: first, mortality estimates in countries of origin are
not always available for comparative purposes; second, even
when they are, differences in health care between countries
render the comparisons meaningless, and; third, the regions of
origin of the migrants in their home countries are likely to be
different in their mortality profile from the national average. In
Abraido-Lanza et al.’s paper, the mortality rates in Puerto Rico,
Cuba, and Mexico were found to be lower than those of the US,
and this was interpreted by the authors as consistent with a
cultural explanation of the Latino mortality paradox. Those
comparisons, however, were not very convincing, given that, as
pointed out by Landen, they involved crude rather than age-
standardized mortality rates. In Europe, the French study is the
only one which has incorporated comparisons with the country
of origin of the migrants (Morocco). The picture which emerges
is that of a much higher life expectancy for the migrants than
that estimated for the population of Morocco: the gain in life
expectancy was 9.9 years for men, and 11.6 years for women.
This may reflect the healthy migrant hypothesis, but not neces-
sarily. Generally speaking, international comparisons are
extremely difficult to interpret, with countries differing in numer-
ous factors which influence all-cause mortality, among which
are social class, economic indicators, and effectiveness and
accessibility of health care and other services.

In addition, one may legitimately wonder to what extent the
selection of applicants for immigration on the basis of their
health is a plausible explanation of the mortality paradox.
Indeed, two questions are left unanswered: first, do the health
selection effects persist long enough to explain a mortality
advantage decades after it has taken place, and second, if the
migrants are healthier at entry, what are the factors underlying
their superior health? Concerning the first point, surprisingly
little has been published. Study of an industrial cohort in Great
Britain has shown that the ‘healthy worker effect’ was no
longer visible 15 years after entry in the cohort, while con-
versely an analysis of the Assets and Health Dynamics of
the Oldest Old (AHEAD) in the US concludes that good health
of a population at young ages is maintained throughout the
lifespan. As for Hispanics, the literature indicates that their
health and health behaviours deteriorate with accultur-
ation. Clearly, more empirical and theoretical studies are
needed.

Supposing health selection is the key explanation to the
mortality advantage, then what are the factors underlying the
superior health of the migrants? Do they have lower mortality
rates just because the health checks have filtered out the
disabled and chronically ill? Or do they have more favourable
health behaviours? According to Uitenbroek and Verhoeff, who
have investigated mortality of the Mediterranean migrants
in Amsterdam, selection at entry is not a convincing explanation
for their remarkable life expectancy. Indeed, in their twenties
and early thirties ‘symptoms of the major causes of death, i.e. cancers
and cardiovascular disease are rarely present, and it is difficult
to imagine how these young people could have been selected
on their future susceptibility’ to those diseases. Those authors,
in accord with Razum et al., are more supportive of the ‘unhealthy
re-migration hypothesis’; in fact a more elaborated version of
the ‘salmon bias hypothesis’ which assumes that migrants who
re-migrate are those who do not cope well socially and economically,
and that those migrants are more likely to experience higher
mortality in the future. This can be viewed as a kind of ‘indirect
selection’ on factors connected to both socio-occupational skills and health capital, similar to that which has been conceptualized regarding unemployment. 

The mechanism would be that both unemployment and health are related to a certain personality trait. Could we imagine also that an indirect selection is involved in the migration process, with factors connected to both the will and capacity to migrate and to health? In relation to the ‘salmon bias’ concept, Razum et al. also question the plausibility of re-migration of severely ill migrants, considering that it is unlikely that Turkish residents return to their home country when they suffer from ‘conditions such as cardiovascular disease for which medical treatment in Germany is readily available and almost free.’ Economic considerations could therefore deter sick migrants from going home, unless they are moribund, but in this case do they have the strength to undertake a journey back home?

Abraido-Lanza et al. consider that the role of cultural factors involving favourable health behaviours is an attractive hypothesis to be tested. If it is confirmed, then this would mean that the migrants would be benefiting from the ‘best of both worlds’; the favourable habits of their country of origin and the efficiency of the health care system of their host country. Of the two studies in Europe, the one which has examined causes of death and gathered data on health-related habits is the French one, and the results are quite mixed: on one hand, the death rates from cancers and cardiovascular diseases are much lower among Moroccan males than in the French population, on the other hand, their lifetime consumption of tobacco is comparable, though there are indications that their nutritional habits could be more favourable. One important feature of the Moroccan community in France is that they drink very little alcohol, and this could play a major role in their mortality advantage: of all countries in the European Community, France is the one with the highest percentage of heavy alcohol drinkers, and it is characterized by a high alcohol-related premature mortality. There might be cohort effects involved in the lower lung cancer mortality of the Moroccans in France, with heavy smoking limited to the younger cohorts who have not yet reached the age at which lung cancer rates start to rise. Also, a role for alcohol consumption in lung cancer aetiology has been suggested in some studies, and one may wonder whether Moroccans are protected from lung cancer in part because they drink very little alcohol. Lastly, the potential role of differential exposure to genetic factors of susceptibility to lung cancer is worthy of consideration. Greeks in Australia are another Mediterranean migrant group which was found to have an exceptionally high life expectancy in spite of continuing high rates of cigarette smoking, and this was attributed to the offsetting effects of the Mediterranean diet.

One of the reviews of the Hispanic paradox concluded by saying that there was a reasonable degree of certainty that the paradox was real for some subgroups, among them older Hispanics. In France and Germany, the older cohorts of migrants were precisely those which had the most difficult and hazardous working conditions, in the mines and the automobile industry. They would, therefore, be expected to have higher mortality. In fact, this was the case for migrants from Eastern European countries but not for Mediterranean migrants. To date, the causes of the paradox are largely unknown, be it in the US or in Europe, and, as pointed out by Franzini et al.:

if the reasons are largely cultural, then the paradox will only exist for as long as a large percentage of Hispanics remain culturally distinct from the rest of the US ... a rare window of opportunity now exists to learn more about how cultural factors influence one’s health...  

The migrants’ mortality paradox raises challenging questions about the nature of the selective processes related to migration, and those questions have a bearing on health-based selection in general and on the potential role of indirect selection in explaining part of the association between socio-demographic factors and health.

The opening up of new research avenues is desirable to meet the challenge, along the lines recently delineated by Schwartz, Susser, and Susser. More attention should be paid to the historical context of migration and the past living conditions of the different waves of migrants, before and after migration, and to the legal and jurisdictional aspects of re-migration. Shifting the emphasis from individual-based studies to studies of communities as a whole and of the cultural factors that are related to management of health and disease may provide explanatory leads. As pointed out by Palloni, studies of migrants in their host countries should be complemented by:

studies of the sending populations, including those people who have returned after being migrants, those who could have been migrants but were not, and those who tried unsuccessfully to be migrants.

Also, qualitative studies are potentially very informative with respect to the acculturation process and its health-related aspects, to the cultural representations of health, and the range of motives for re-migration. Last but not least, an international perspective on the subject would throw new light on the how’s and why’s of this enduring epidemiological enigma.

References


Food insecurity definitions and body mass index. Response

From MARTIN GULLIFORD, DEEPAK MAHABIR and BRIAN ROCKE

In his commentary on our recent paper,1 Dr Edward A Frongillo2 criticizes our use of a well-described household food security scale in Trinidad. There will always be some uncertainty concerning the application of a given measure as there is no perfect instrument to evaluate food security or dietary patterns in any population. The household food security measure was used in the US national Current Population Survey (which provided the comparison data used in Dr Frongillo’s commentary) but the application of the instrument to all groups in the multilingual, culturally diverse US population ‘has not been examined sufficiently’ (ref. 3, p. 8). Questionnaire evaluation must be considered when differences in literacy, language, dialect, or culture, as well as socioeconomic status, may influence responses and this consideration might suggest that an instrument should be tailored to local requirements. It is advisable, however, to be judicious in modifying such measures so as not to compromise the validity or comparability of an instrument. Departures from a previously tested template should only be undertaken to guarantee enhanced performance of a measure. Dr Frongillo’s comments appear to underestimate both the weight of evidence required to justify an alteration to an established measure and the limitations of local ‘validation’ studies. Before concluding that a measure gives unsatisfactory results in a given local population, or a particular group within a population, it is essential to ensure that the findings cannot be ascribed to error or bias. There is a relatively high risk that local questionnaire evaluation studies, implemented within the short time scales suggested, will lead to erroneous conclusions if sample sizes are too small or if subjects are insufficiently representative.

While our data suggested an unexpected difference in the frequency of food insecurity according to ethnicity, it would be premature to conclude that the instrument had differential validity in these groups. We had no prior hypothesis about ethnic differences in food insecurity. The study used cluster sampling with the selection of a relatively small number of neighbourhoods. Food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more.

We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the instrument to evaluate food security or dietary patterns in any population, it is essential to ensure that the findings cannot be ascribed to error or bias. There is a relatively high risk that local questionnaire evaluation studies, implemented within the short time scales suggested, would be tailored to local requirements. It is advisable, however, to be judicious in modifying such measures so as not to compromise the validity or comparability of an instrument. Departures from a previously tested template should only be undertaken to guarantee enhanced performance of a measure. Dr Frongillo’s comments appear to underestimate both the weight of evidence required to justify an alteration to an established measure and the limitations of local ‘validation’ studies. Before concluding that a measure gives unsatisfactory results in a given local population, or a particular group within a population, it is essential to ensure that the findings cannot be ascribed to error or bias. There is a relatively high risk that local questionnaire evaluation studies, implemented within the short time scales suggested, will lead to erroneous conclusions if sample sizes are too small or if subjects are insufficiently representative.

While our data suggested an unexpected difference in the frequency of food insecurity according to ethnicity, it would be premature to conclude that the instrument had differential validity in these groups. We had no prior hypothesis about ethnic differences in food insecurity. The study used cluster sampling with the selection of a relatively small number of neighbourhoods. Food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more. We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the household food security scale in each local setting, special consideration should be given to reviewing this item when the instrument is revised.

A potential for misclassification of food insecurity status does raise a concern that a possible true association between food insecurity and obesity might be attenuated. In order to explore this possibility, we repeated our previous analyses using the same methods but with two modifications to the classification of food insecurity. We first used a cut-point of three rather than two to identify subjects who were food insecure. We then omitted the ‘balanced meal’ item from the assessment of food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more. We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the household food security scale in each local setting, special consideration should be given to reviewing this item when the instrument is revised.

A potential for misclassification of food insecurity status does raise a concern that a possible true association between food insecurity and obesity might be attenuated. In order to explore this possibility, we repeated our previous analyses using the same methods but with two modifications to the classification of food insecurity. We first used a cut-point of three rather than two to identify subjects who were food insecure. We then omitted the ‘balanced meal’ item from the assessment of food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more. We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the household food security scale in each local setting, special consideration should be given to reviewing this item when the instrument is revised.

A potential for misclassification of food insecurity status does raise a concern that a possible true association between food insecurity and obesity might be attenuated. In order to explore this possibility, we repeated our previous analyses using the same methods but with two modifications to the classification of food insecurity. We first used a cut-point of three rather than two to identify subjects who were food insecure. We then omitted the ‘balanced meal’ item from the assessment of food insecurity, income, and ethnicity each showed evidence of clustering within neighbourhoods. Imbalances in the characteristics of different groups could arise through chance. A larger study will be required to determine whether this finding will be replicated. Dr Frongillo observes that the ranking of the prevalence of affirmative responses to the first two items differs in our data as compared with the US data. This seems to overemphasize the Guttman-like properties of the scale, since it is not clear that an inability to afford balanced meals should always indicate a greater severity of food insecurity than that for a person finding that her food did not last and being unable to buy more. We agree that the ‘balanced meal’ item may be unsatisfactory but rather than concluding that this requires the adaptation of the household food security scale in each local setting, special consideration should be given to reviewing this item when the instrument is revised.