Socioeconomically but Not Medically Deprived?

Henry J. Dargie, MB, ChB, FRCP, FESC, FRSE; Theresa A. McDonagh, BSc, MB, ChB, MD, FRCP

In this issue of Circulation, Hawkins et al report the impact of socioeconomic deprivation on aspects of the quality of delivery and outcomes of primary medical care in patients with heart failure.1,2 The specific marker of quality examined was the rate of prescription of evidence-based medicines, and outcomes assessed were death at 1 year and the incidence and prevalence of heart failure over a period of 8 consecutive years. The setting was the National Health Service (NHS), which provides universal access to free health care to the population of the United Kingdom.

The vehicle for the study was the General Practice Research Database (GPRD), a primary care electronic resource of anonymized patient records which, when including data on social deprivation, covers ≈1.6 million people or 3% of the UK population.2 During the period of study there were steadily rising rates of prescription of angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, β-blockers, and spironolactone, respectively, from 46% to 68%, 12% to 41%, and 3% to 20%.

This was associated with year on year and, quite striking, overall decreases in the incidence and prevalence of heart failure across all 5 categories of deprivation. Despite these improvements in treatment and apparent easing of the burden of heart failure across the entire socioeconomic spectrum, the 1-year mortality from heart failure did not fall. This study raises many issues regarding the adequacy of the monitoring and implementation of effective management strategies in a national healthcare system. A possible key confounder in the interpretation of all these data is the strain this places on the health care system in the face of increasing pressure for health care delivery.

A possible confounder in the interpretation of all these data is the effect of socioeconomic deprivation on aspects of the quality of care delivered and outcomes assessed. Despite the improvements in treatment and apparent easing of the burden of heart failure across all 5 categories of deprivation, the 1-year mortality from heart failure did not fall. This study raises many issues regarding the adequacy of the monitoring and implementation of effective management strategies in a national healthcare system. A possible key confounder in the interpretation of all these data is the strain this places on the health care system in the face of increasing pressure for health care delivery.

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

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better validation by echocardiography. The fall in incidence is consistent with, but greater than, other studies and may reflect better treatment of the risk factors for heart failure in primary care. Well-validated case ascertainment occurs in studies of first unscheduled admissions to hospital for the treatment of heart failure, but these studies, of which there are several, underestimate incidence by excluding those presenting in the community but not admitted to hospital during the year of the study. Arguably, best of all are those studies, of which there are few, where objective cardiac assessment is made in patients presenting for the first time either to hospital or in primary care. Examples of such studies in the UK from the same era as the present study both report incidences somewhat lower than the 0.2% reported here.5,6

Second, heart failure has been traditionally associated with a high annual mortality, with which the 44% and 38% reported in the above studies is consistent. Although the latter was a mixed community/hospital study, the majority of patients recruited were identified during a hospital admission. Physician-based diagnoses were made by a panel of cardiologists based on the clinical picture, ECG, imaging, and all other relevant data. Data from the NHS in England using the National Heart Failure Audit confirm that, in 2010, the high 1-year mortality of patients admitted to hospital continues largely unabated at ≈30%.7

Compared with these data, the annual mortality in Hawkins et al of only 5% overall and ≈2% to 3% in the most affluent is rather low and requires explanation. The GPRD’s strengths as a research tool are its size, perceived representativeness of patient and practice characteristics, and the recording of referral to secondary care. An extensive number of codes derived from both community and hospital records were used to construct the study cohorts. It would seem that, based on the low mortality, the majority of patients received their diagnosis in primary care and would not yet have required either a consultation at or an admission to hospital.

When the provenance of diagnosis was dissected from a randomly constructed cohort of patients in primary care receiving heart failure medicines,8 mortality at 4 years was 33% in those with a previous hospital admission compared with 15% in those in whom the diagnosis was made in primary care and those who had no evidence of heart failure (Figure 1). Although disappointing that better uptake of medicines proven to reduce mortality did not improve survival, prescription rates of 64% and 41% are low compared with those in the clinical trials and dose levels and adherence are very likely to have been lower than in the trials.9 However, increasing prescription rates, especially with the renin-angiotensin-aldosterone system antagonists, were attained also in the oldest cohort of patients >75 years of age.
The National Heart Failure Audit of patients hospitalized for the treatment of acute heart failure found rates of angiotensin-converting enzyme inhibitors to be 68%, β-blockers 65%, and mineralocorticoid receptor antagonists 36%, which, although higher, also are suboptimal. They are noticeably lower than relatively selected registries in the United States or in Europe. In Sweden, however, the unselective registry covering most hospitals in the country shows higher rates of prescription and generally favorable outcomes.

Relevant to deprivation and outcomes is the disturbing finding in the 2010–2011 Report of the National Audit in England and Wales audit that those in the most deprived socioeconomic group were 5 years younger than their most affluent counterparts at the time of their first admission for heart failure (Figure 2). Dealing with the societal, political, and educational causes and consequences of socioeconomic deprivation is well beyond the scope of this article, but we should be aware of the increasing knowledge base concerning the biological mediators of the ill health that it causes, which could further compromise the benefits of the apparent equity of access of the deprived to healthcare.

To what extent does the GPRD itself reflect real-life care? Simply taking part in an audit program may foster awareness and provision of best practice. In a true real-life setting, therefore, prescription rates might be even lower and outcomes poorer than those reported in this study. In primary care the new system of remuneration encourages best practice in specific areas such as the management of chronic diseases for which there is an accepted protocol of management through the Quality Outcomes Framework (QOF). This includes returning data annually on prescribing in hypertension, coronary heart disease, diabetes mellitus, and other risk markers for heart failure. However, as the authors point out, this started halfway through this study period and therefore the data were consistent throughout. Nevertheless, it would be useful to compare outcomes in practices within and without the GPRD.

The important messages for patients and healthcare providers are several. First, large and significant differences still exist in the life chances of people at the social extremes of affluence and deprivation. In the specific instance of medicine prescription and benefits in this study, there were no differences among these groupings. Nevertheless, in the most deprived, heart failure appears to progress faster as reflected in their significantly younger age at the time of admission and therefore death at a younger age than the more affluent. Although this study shows that delivery of heart failure medicines can be equitable, the outcomes of the most deprived remain substantially worse than the more affluent.

Second, we cannot conclude from this study that completely free access to health care, as in the NHS in the United Kingdom, drives better outcomes, nor that collecting data is good for patients by encouraging best practice, but plausibility is enhanced by specific examples.

Third, given the rise in patient expectations and healthcare costs, it seems likely that all healthcare providers, both public and private, eventually will insist that monitoring of personal and institutional performance become mandatory. Organizing such a complex prescribing and management portfolio as is the optimum care of patients across the broad spectrum of heart failure is not easy. Even to approach, let alone equal, the success of clinical trials, we must reorganize care to deliver the specialist treatment that patients access when they enter a clinical trial.

Fourth, we should take more advantage from national monitoring organizations such as the GPRD. Already the world’s largest such database, the GPRD recently has undergone metamorphosis into the Clinical Practice Research Database (CPRD) funded nationally and jointly by the Medicines and Healthcare products Regulatory Agency (MHRA) and the National Institute for Healthcare Research (NIHR). Adding to these groupings the recent establishment under one

<table>
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<tr>
<th>Deprivation group</th>
<th>Mean age at first admission (years)</th>
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<tbody>
<tr>
<td>1 = most affluent</td>
<td>78.9</td>
</tr>
<tr>
<td>2</td>
<td>78.8</td>
</tr>
<tr>
<td>3</td>
<td>77.8</td>
</tr>
<tr>
<td>4</td>
<td>76.4</td>
</tr>
<tr>
<td>5 = most deprived</td>
<td>74.0</td>
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* Based on quintiles of IMD score

![Figure 1. Survival of patients in 1-year care diagnosed during a hospital admission (Hospital HF, solid black line), patients in 1-year care with a diagnosis of HF confirmed after specialist review (GP HF, solid pink line), and patients receiving treatment for HF in whom the diagnosis was excluded after specialist review (Non HF, dotted black line).](http://circ.ahajournals.org/content/123/4/706.

![Figure 2. First hospital admission for heart failure by age.](http://circ.ahajournals.org/content/123/4/706.

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roof, the National Institute of Cardiovascular Outcomes research (NICOR), of all the secondary care national audits, creates a formidable clinical and research opportunity. Insofar as heart failure is concerned, a first task would be to review the diagnostic criteria for case ascertainment to assure validity of identification not only of heart failure but also its precursors.

Previous work has confirmed the poor prognosis of asymptomatic left ventricular systolic dysfunction,\textsuperscript{19} whereas the present study probably included many patients with symptoms of heart failure, in the context of appropriate risk factors but not necessarily cardiac dysfunction. There is therefore a clear need for trials investigating this early phase of the disease, for there is little doubt that hospitalization for heart failure signals the arrival of its end stage.

These thought-provoking data have raised many interesting and important questions, not only about socioeconomics and heart failure but also the detection, definition, diagnosis, and management of its causes and precursors wherein lie the greatest opportunities for benefit through prevention of clinically obvious heart failure.

Disclosures
None.

References

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