

Social isolation and susceptibility for developing heart failure: are we exchanging a global pandemic for a new crisis in the making?

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Social networks are indispensable in our lives and positively impact our physical and mental wellbeing.¹ Both frequency as well as quality of social interactions have been linked to less cardiovascular disease and improved life expectancy. As time progresses, social networks naturally shrink as the consequence of widowhood, loss of friends, or limited capability to travel. It therefore comes as no surprise that many 80-year-olds score their social status as unsatisfactory, and this number is expected to increase due to ageing of the population in many countries. Since the start of the Corona Virus Disease 2019 (COVID-19) pandemic, the majority of the world was ill prepared and sought to address the most direct consequence of this disease, i.e. to look after patients who contracted COVID-19 and were in need of urgent (critical) care. Lockdown and social restrictive measures to mitigate the burden on strained healthcare systems were put in place. As an unsolicited social experiment, the COVID-19 pandemic's largest intangible side-effect was its profound impact on social networks and interactions. There is an extensive body of evidence which links social relationships, often co-existent with societal inequalities (e.g. poor housing, lower income, access to healthcare amongst others) to establishing cardiovascular disease more frequently but also at an earlier age.^{1–3} Figure 1 adopted from the source Coyte et al.⁴

In this issue of the *European Heart Journal Open*, Coyte et al.⁴ describe the association between the quality of social relationships and

the risk for developing heart failure. The authors measured social relationships by questioning study participants on the (i) frequency of contact with family, friends, or other relatives, (ii) the satisfaction or quality of these social contact moments, (iii) marital status, and (iv) as to whether they lived alone. From there, they tested different aspects of this score in isolation or combined into two summary score, one including only the frequency and perceived quality of social interactions, and the second score adding marital- and living status to the equation (see Figure 1). In ~3700 elderly men in the UK, aged between 60 and 79 years, who did not have heart failure at baseline, 338 (9.1%) of them developed heart failure throughout a median follow up of 15.9 years. The primary finding from the work of Coyte et al. was that social relationships were strongly associated with an increased incidence of heart failure, and its association seemed independent of age and social deprivation markers such as socioeconomic class, as well as traditional cardiovascular risk factors. In fact, they report an increased risk of 38% for developing heart failure for socially isolated men compared to the socially active, after extensive adjustments. Living alone and/or marital status—perhaps somewhat as a surprise—were not significantly associated with incident heart failure. Without falling into marital clichés, this neutral result could be explained by the varying degree of ‘success’ of any given marriage; a comforting blessing for some, continuous stress and conflict to others, and anything ranging in between.

Several other novel findings are worth noting: (i) the denominator itself. The abovementioned hazard ratio 1.38 (95% confidence interval 1.02–1.87) describes the difference between 566 elderly men, or 15.3%, compared to 3132 men, or 84.7%, with a high self-reported social relationship score. This means that one in six elderly men in

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<p style="text-align: center;"><u>FREQUENCY OF CONTACT</u></p> <p>How often do you see or speak to each of these: Your children, Brothers/Sisters, Friends, Neighbours</p> <p>->High contact: Every week/Every month (2 Points)</p> <p>->Low contact: Every few months/Every year/Rarely or Never (1 Point)</p> <p style="text-align: center;"><i>Dichotomised score: (Score range 0-8) high contact ≤ 4 and low contact ≥ 5.</i></p>	<p style="text-align: center;"><u>SATISFACTION WITH CONTACT</u></p> <p>Is the amount of contact you have with each of these: Your children, Brothers/Sisters, Friends, Neighbours</p> <p>->High satisfaction: About right/Too much (1 Point)</p> <p>->Low satisfaction: Too little (0 Points)</p> <p style="text-align: center;"><i>Dichotomised score: (Score range 0-4) high contact ≤ 2 and low contact ≥ 3.</i></p>
<p style="text-align: center;"><u>MARITAL STATUS</u></p> <p>->Married (2 Points)</p> <p>->Not married (1 Point)</p>	<p style="text-align: center;"><u>LIVING STATUS</u></p> <p>->Don't live alone (2 Points)</p> <p>->Live alone (1 Point)</p>
<p style="text-align: center;"><u>SOCIAL RELATIONSHIP SCORES</u></p> <p>1) Social Relationship Score 1- Total of frequency of contact, satisfaction with contact</p> <p style="text-align: center;"><i>Dichotomised score: (Score range 0-8) High scores ≤ 4, low score scores ≥ 5</i></p> <p>2) Social Relationship Score 2- Total of frequency of contact, satisfaction with contact, marital status, living status</p> <p style="text-align: center;"><i>Dichotomised score: (Score range 0-10) High scores ≤ 5, low score scores ≥ 6</i></p>	

Figure 1 Social relationships measures.

the UK consider themselves socially isolated. Putting these numbers in perspective makes social isolation more common than diabetes (~12% in this cohort), roughly equal to vascular disease and obesity (~15% and ~16%, respectively), and less common than hypertension or hypercholesterolaemia (~23%, and ~85%, respectively). (ii) There seemed to be a dose–response relationship, seen in the Cox Proportional Hazard Models provided for the continuous score, showing that the risk gradually decreases as the social relationship score increases. Recent data on development of premature cardiovascular disease in the USA also showed this trend for increasing levels of social inequalities.²

What are the implications of this study? First and foremost, given the clear association between social relationships and incident heart failure, it asks for a critical re-appraisal of current preventive measures, which still largely take aim at conventional cardiovascular risk factors such as obesity, diabetes, hypertension, lipids, and so on. On the other hand, establishing true causality is difficult as they have used observational data. Measured confounders have been corrected for by the authors, but many other unmeasured confounders such as concomitant depression, self-management such as compliance to medication, could have influenced this association. In other words, intervening at scale in strengthening social relationships should be tested for efficacy in reducing heart failure, amongst other cardiovascular diseases.

Secondly, it shows that one in six elderly men describe themselves as lonely, which is considerable. These data have been derived before the global COVID-19 pandemic, and it is safe to say that social restrictions by the COVID-19 crisis increased rather than decreased this number. Data during and after the COVID-19 pandemic will be useful to examine and strengthen the authors' conclusion that social relationships play an important role in maintaining a healthy life free of heart failure. Lastly, these data show that it is worthwhile to investigate the impact of social activity and the authors should be commended for establishing the relationship between social activity and heart failure with scientific rigour. Endpoints (i.e. heart failure) were carefully adjudicated for each case, rather than inferred from bulk ICD-10 codes or GP records alone. Furthermore, extensive correction for other factors covering social deprivation measures, classic cardiovascular risk factors, and behavioural factors, ensured that the multivariably regressed hazard ratio's reliably approximate the association between social activity and the outcome. However, they did so in a group of predominately white men, a group which probably in public health measures were not amongst the highest risk individuals in the UK. In terms of clinical relevance, it would have been more interesting to gauge the level of social isolation in ethnic minorities and/or women, and how that impacted occurrence of heart failure.

The current work straightforwardly highlights a vulnerable group in society who are more susceptible to developing heart failure. Maintaining good social relationships not only promote mental well-being but also seem key to allow an ageing population to age healthier. Social interactions as a powerful and cheap health tool have been severely impacted by the COVID-19 pandemic which necessitated prolonged periods of social isolation to prevent the collapse of healthcare systems. As we seem to progress from COVID-19 pandemic to—endemic, this study forecasts that we should be cognisant of the non-tangible sequelae of our COVID-19 response, which involves increased numbers of socially isolated people at higher odds of developing heart failure, who need our help.

Let us not exchange one crisis for the other.

Conflict of interest: none declared.

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