European Heart Failure Mission

The Heart Failure Policy Network

European Heart Failure Mission research priorities

Horizon Europe and EU4Health are the largest sources of funding for health in the European Union (EU), with a total budget of €100 billion. With the aim to improve the health of citizens and ensure the sustainability of the EU, the European Commission should direct these programmes to substantially increase research and development in cardiovascular health. This field has lagged drastically behind other disease areas in the past decades,[1] despite cardiovascular disease remaining the number one killer in the EU and being an important contributor to the slowing improvements in life expectancy.[2]

This document outlines the critical opportunities that increased research funding could unlock in heart failure, the leading cause of preventable hospitalisations in Europe. The challenges and opportunities at stake transcend borders, require long-term vision, and should be approached as a collective action by European nations and the EU.

These research priorities have been guided by HFPN members. They align with the expectations of people with heart failure for a timely and accurate diagnosis, access to the best treatments (highlighted, for example, in the *Heart Failure Patient & Caregiver Charter* of the Global Heart Hub)[3] and improved quality of life (highlighted in the patient-led report on quality of life, *Heart failure: an inconvenient truth*).[4] It is vital that people with lived experience are involved in research programmes and can play an important role in setting the priorities, as well as in the design and implementation of research projects.

Ensuring a timely and accurate diagnosis

Why does this matter?

People with heart failure are often diagnosed too late, which means a vital opportunity is missed to halt disease progression, maximise people's independence and save lives. Most people with heart failure are diagnosed in hospital[5] when potentially irreversible heart damage has already occurred.[6] At this stage, they are almost twice as likely to die prematurely as if they had received a diagnosis before a hospitalisation was needed.[7] There are long waiting lists to access heart failure diagnostic services, which can extend to more than 100 days, with women waiting for a diagnosis on average six times longer than men.[5] These delays result in a missed opportunity to provide treatment early and, consequently, mean worse outcomes and quality of life.

Research priority 1: How can we detect the undetected population with heart failure?

We need more targeted approaches to identify people at risk of heart failure, so we can focus resources where they are needed. We know that certain population groups are at a higher risk of developing heart failure (e.g. people with diabetes, frailty, hypertension, chronic obstructive pulmonary disease, chronic kidney disease, anaemia).[8-10] We need real-world, pragmatic studies to identify people at risk earlier, using new care pathways, case-finding algorithms in primary care, and diagnostic tools.[11]

We need much greater use of emerging technologies for faster heart failure diagnoses. There are several promising new technologies, such as point-of-care devices and AI-enabled techniques, with the potential to diagnose heart failure earlier.[11] These technologies must be further developed and tested at scale to maximise their benefit for people with heart failure and increase the efficiency of diagnosis. For example, in one study, a handheld echocardiogram that can be used by non-specialists was integrated into the diagnostic pathway, reducing waiting times from 12 months to less than 4 months.[12] Other innovative tools such as wearables enable the ongoing monitoring of people at high risk of heart failure.[13]

Pioneering more effective therapies and disease management

Why does this matter?

There is a significant knowledge gap concerning the processes leading to heart failure, which is hampering the development of effective personalised treatments. Heart failure occurs when the heart becomes too weak or stiff to pump enough blood to meet the body's needs,[14] but the diverse underlying causes and disease mechanisms involved in this process remain poorly understood.

Research priority 2: How can we halt disease progression among people with heart failure?

We need a better understanding of the structural changes occurring in the heart, so we can learn to improve heart function and halt their progression to heart failure. Cardiac remodelling is the process whereby the heart undergoes the structural changes seen in heart failure.[15] Fewer than half of people with heart failure receive treatment that improves cardiac remodelling,[16] even though such improvement is associated with better outcomes and quality of life.[17] By understanding the relationship between cardiac remodelling and biomarkers, we can gain insights into how heart failure develops and what therapies could protect heart function, and anticipate the person's response to treatment.[17 18] These new treatments could be tailored to each individual, targeting their specific subtype of heart failure.[19]

We need new insights into effective treatments for people with heart failure with preserved ejection fraction (HFpEF) that can modify how the condition progresses. Until recently, there was no effective treatment for HFpEF, and there remains a limited understanding of the processes involved in this type of heart failure. The high rate of coexisting conditions (e.g. cardiac, metabolic, pulmonary, renal and geriatric diseases) among people with HFpEF suggests that these conditions may play a role in the development of heart failure, possibly by activating systemic inflammation (exaggerated chronic activation of the immune system).[20] However, research is only just starting in this area and clinical trials so far have been inconclusive.[21] Recent studies have shown that treatments targeting specific heart failure subtypes may reduce heart failure incidence and deaths.[22] Further research is needed to identify new therapies for specific heart failure subtypes.

Research priority 3: How can we leverage the data revolution in the development of personalised heart failure treatments?

We need to harness the power of AI and bioinformatics to help us make sense of the complex interactions that underlie heart failure. Identifying the diverse subtypes of heart failure and increasing our understanding of them will open up opportunities for

new therapeutic research and targeted treatments. The emerging field of multi-omics (genomics, epigenetics, proteomics etc.) can help us achieve a detailed understanding of all the biological processes that can lead to heart failure. The huge amount of data generated by multi-omics can only feasibly be analysed with the assistance of AI. We need much deeper profiling, leveraging big data and AI-driven approaches to tackle the complexity of multi-omics analyses.[23] In other diseases (e.g. hypertrophic cardiomyopathy), an increased understanding of genetics has had huge implications for treatment.[24]

Better quality of life

Why does this matter?

Quality of life is a major priority for people living with heart failure. National patient advocacy organisations across Europe (Pumping Marvellous, Association Vie Et Cœur, Herzschwäche Deutschland and The Patients Voice) have called for putting quality of life and psychosocial needs at the centre of heart failure care.[4] The impact of heart failure on people's lives cannot be underestimated, as it affects their physical, mental and social wellbeing, and reduces their independence. In fact, one in five people with heart failure declares themselves as having a disability.[4]

'We ask if a person is doing well, but that's not enough. Assessing people's psychological status will help determine the risk of heart failure, detect heart failure at an early stage and monitor its progression. We should really take into account that the brain gives signals to the entire body.'

Yvan Devaux, Head of Cardiovascular Research Unit, Luxembourg Institute of Health

Research priority 4: How can we provide holistic care for people with heart failure and improve their quality of life?

We need to understand the impact of psychological stress on the body among people at risk of or already living with heart failure. We know that stress and mental health conditions such as depression are common among people with heart failure.[25] They can lead to an increased risk of hospital admissions and premature death.[26] It has also been suggested that depression can increase the risk of heart failure among the general population, but further research is needed to understand this relationship and identify the underlying disease mechanisms.[27] We already have wearable monitors for the continuous measurement and monitoring of the stress hormone cortisol.[28] The inclusion of cortisol and other stress-related biomarkers into studies could provide critical new insights on the role of stress in heart failure, possibly aiding better and earlier prediction of cardiovascular events such as hospitalisations.[29] Overall, investigations linking the brain and the heart have the potential to improve heart failure management and outcomes.

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