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### **Applying digital early warning systems to healthcare**

Abstract. The number of people aged over 60 will exceed 20 million by 2030 in the UK, exacerbating pressure on health and social care, carers and families. Methods such as the National Early Warning Score (NEWS) can predict a heart attack within 24 hours, but require users' vital signs to be regularly monitored, implying labour-intensive manual checks, and connecting medical equipment or wearable devices, acceptable in the hospital setting, but inconvenient and uncomfortable for older users at home. Furthermore, conventional home-based alarms can only raise an alert after a user has either pushed a button or remained immobile for some time, often too late to receive a life-saving intervention. Xim is prototyping and trialling preventive monitoring technology combining computer vision with data analytics to address the challenge of providing early warning for older patients at low cost. Using only a standard camera, the system can detect a user's vital signs by observing tiny changes in skin colour. If there is a high health risk within the next 24 hours, nursing staff and carers will be alerted while there is still time to intervene. This will allow patients who are currently rarely monitored to be constantly checked for signs of deterioration. Over time, users will be encouraged to review their own data, using this technology as part of their self-care management; initially the system will be targeted to support GPs with patients in care homes.

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