UNIVERSITY OF LEEDS

SafetyNet: the effects of interoperable networks on patient safety

Feedback to stakeholders

Background

When we met in June 2018, we asked you for your views on the ways in which interoperable networks might support the delivery of safer treatment and care. Your comments were very helpful, and have substantially shaped our work over the last year. We have now completed our literature review, and would value your comments on our findings. The ways in which you can respond to us, or request more information, are set out at the end of this note.

Methods

We have undertaken a systematic literature review, using a method called realist synthesis. As in all realist syntheses, there were two main phases of work. You were part of the first phase. We identified ways in which people – informatics leads, policy makers, leading academics and others – believed that interoperable networks might support safer treatment and care. That is, we were interested in their theories - or their assumptions - about the ways they worked. We used your comments, alongside commentaries in policy documents and articles, to develop a simple 'model'. This is shown in the diagram below.

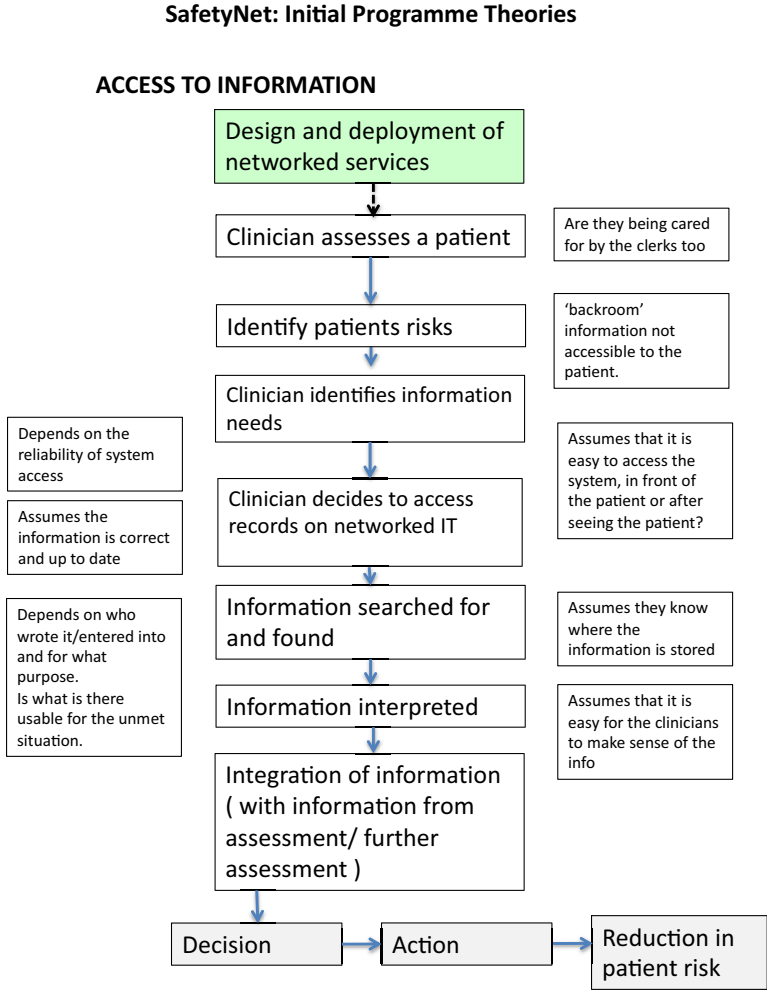
In the second phase we undertook literature searches, which were designed to allow us to say whether or not there was evidence to support the model, or indeed evidence that suggested that interoperable networks worked in some other way. The searches focused on evidence about three topics:

- The co-ordination of services for older people who are living in their own homes, and supported by two or more professionals;
- The reconciliation of medication lists, from different organisations, for older people who are living at home, e.g. people who have just left hospital for home
- Children who are at risk of harm

For each topic, we searched for evidence about the nature of the problems with services, experiences of using interoperable networks, and changes in patients' risks associated with the use of networks.

Results

The simple model that we developed, and that guided our searches, is in the Figure below. The centre column represents the ideal – a situation where information is seamlessly searched for, found and used by a professional. The columns on either side list issues that might complicate or scupper the ideal.



The co-ordination of services for older people

We found substantial evidence about the nature and extent of care co-ordination problems. Most of the problems were essentially social or cultural in nature. For example, there were several studies where different healthcare professionals had incompatible beliefs about the kinds of support that older people needed. The problems were attributed to a combination of inter-professional issues – not directly related to technology – as well characteristics of the networks (such as multiple logins) they were using, and the difficulty of locating patient information held on other organisations' servers. We did not find any countervailing studies, which reported 'seamless' use of interoperable networks.

There was limited, and weak, evidence about the effectiveness of interoperable networks in reducing older peoples' risks. The evidence was for networks with limited functionality, typically involving a single application (such as a shared assessment process), and based on the subjective views of users. We did not find any quantitative evidence of effectiveness.

The co-ordination of medication reconciliation

Errors in reconciling medication lists, and lists with patients' current medications, are believed to contribute to medication errors, one of the leading causes of adverse events. We found reasonable – rather than extensive - empirical evidence that there is a problem with medication reconciliation. The evidence suggested that the key problem was uncertainty about responsibility for reconciliation on the ground: it was reported to fall between professionals (principally pharmacists, doctors and nurses).

On experiences of using interoperable networks, we found one observational study and seven further 'offline' simulation studies. These focused on the nature of clinicians' cognitive processes when comparing medication lists, and the error rates associated with them. There was less field-based evidence about users' experiences in this domain than in services for older people or child protection services.

There was mixed evidence, of middling quality, about the effectiveness of interoperable networks. Some articles indicated that the use of an interoperable network was associated with a (quantitative) reduction in reconciliation errors. Others reported problems with using systems, resulting in interoperable networks having no effects on reconciliation error rates.

The variation in the methods and data used mean that it is not possible to combine the results in any useful way.

Child protection

The Government is currently promoting the *Child Protection – Information Sharing* programme in England. There is evidence that there are co-ordination problems in child protection services. There is a debate in the academic literature about the nature of those problems. In the context of this synthesis, the key debating point is that some commentators interpret the problems in mechanistic terms – as communication failures – while others argue that the problems reflect more fundamental inter-professional and inter-organisational problems. There is *limited* evidence that users find interoperable networks difficult to use. There is *no* evidence about the effectiveness of interoperable networks in child protection services, defined as a change in childrens' risks of harm.

Conclusions

The conclusions from the realist synthesis are that:

- There is good evidence that there are problems with the co-ordination of services in each of the three domains studied;
- There is evidence across the domains that professionals have found interoperable networks difficult to use;
- There is insufficient evidence about the effectiveness of interoperable networks to allow us to establish how and why they affect patient safety.

Future work

There are three implications for practice:

- Practitioners, including informatics and information leads, should note the lack of evidence about the effectiveness of interoperable networks, and take steps to monitor the effects of local programmes themselves;
- They should take note of the negative evidence about users' experiences, actively seek to involve users in development programmes, and document and publish requirements and specifications;

- They should also be aware of the extent to which institutional arrangements, and in particular the challenges of working across professional and organisational boundaries, influence the deployment and use of interoperable networks.

The priorities for future research are:

1. Primary empirical studies of the effectiveness of interoperable networks in health and social care;
2. Primary empirical studies of economies of scope and scale associated with interoperable networks in health and social care;
3. A realist synthesis of evidence about patient's use of digital platforms;
4. More detailed guidance on the design and conduct of realist syntheses, updating current RAMESES guidance.

Study registration

The realist synthesis is registered with PROSPERO, number 2017:CRD42017073004

Funding details

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Responding and further information

We would be very grateful if you could give us your thoughts about these findings. Are they what you expected? Are you surprised by them?

We are happy to receive your comments in any way that is convenient to you – by email (j.keen@leeds.ac.uk), phone or Skype, or in a meeting if you want us to arrange one. We are also happy to provide any further information you would like, including details of our searches and more detailed accounts of our findings.