

"The application of what is known already will have a greater impact on health and disease than any single drug or technology likely to be introduced in the next decade"

Sir Muir Gray, Director of Clinical Knowledge, Process and Safety at NHS Connecting for Health

A Crisis in Healthcare Delivery

Medical Error

Medical error is a significant cause of suboptimal care and avoidable patient harm.

- Over 10% of admissions to NHS acute hospitals result in adverse events.
- A third of adverse events lead to moderate disability or death.

Knowledge Explosion

The sheer quantity and complexity of medical information, even within a single speciality, is often beyond the power of one person to comprehend.

Centralisation of all knowledge will become rapidly less practical as the scale of the problem increases.

Distributed Data

More data is now collected; the rate of capture is increasing; there are scaling problems in its storage, distribution, interpretation and use at the point of care similar to those for clinical knowledge.

The specific pieces of information most relevant to a particular clinical decision will typically be scattered over a wide range of databases, applications, journals and written notes.

A Grand Challenge: To develop the technology necessary to integrate the vast pool of existing information and knowledge relevant to the care of any specific patient and deliver it in an effective, coordinated manner at the point of care.

Meeting the Grand Challenge: A Roadmap

Where We Are Now *Current Platform*

First generation Clinical Decision Support (CDS) Systems, e.g. alerts and reminders, prescribing aids etc. have been clearly shown to improve practice. Evidence for more sophisticated CDS Systems, e.g. diagnosis, treatment selection etc. is less extensive, but growing.

Services of this kind can be delivered at the point of care using well established centralised models, such as client-server architectures.

Next Steps *Advanced Platform*

CDS Systems will increasingly be expected to support complex, multidisciplinary care pathways in which knowledge service providers are physically distributed and clinical users have different roles and skills.

A centralised approach is unsustainable in this "open" setting. We must make openness work in our favour, using technologies and methods that provide improved decision support as the global knowledge base increases.

Long Term Vision *Future Platform*

Currently implemented CDS Systems are generally highly customised for their particular setting, assuming a well-defined workflow for example. This is inconsistent with normal professional roles.

Greater flexibility could be achieved if services are conceived in terms of clinical goals, roles, responsibilities, and professional commitments based on an explicit medical rationale, rather than rigidly preprogrammed tasks.

Deliverables: Final report including stakeholder requirements, an evaluation instrument for CDSS, a roadmap for future research, a prototype distributed CDSS based on *PROforma* and Open Knowledge, a dissemination video.