The case for using an evolutionary professional protocol for improving care: act local, think global

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Perspective

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This paper outlines an approach to improve care and reduce costs by enhancing the quality of healthcare. We argue that logic and evidence disproves the hypothesis that following national guidance maximises the quality and economy of care. Further, we put forward an evolutionary system to produce change based on co-produced professional judgement. It requires clinicians to diverge from local guidance supported by real-time patient and clinician evaluation of treatment. This is allied to open discussion of results with continuous local comparative feedback and review, supplemented by cross-fertilisation from rotating professionals through different work environments and case series reports.

Consider a fantasy land

Imagine a country where healthcare institutions run within budget but must reduce costs by 25% over five years. To ensure the money lasts, it is decided that every department must offer standardised healthcare to everyone. This saves a small percentage spent on average patients.

Little initial impact is observed on hard outcomes, e.g. mortality, but eventually costs and complaints rise. Overall costs rise as people needing less treatment get the standard amount (commission waste). People requiring extra treatment do not get it initially and are re-admitted to hospitals/develop complications, and remain in care longer (omission waste). This in turn creates delays in treatments for new patients, since spare capacity has been reduced to improve efficiency. Complaints and serious concerns about care quality rise. Expensive reviews indicate the healthcare system culture is more factory-like by offering depersonalised care. Eventually adverse effects on hard outcomes follow (preventable deaths).

Current UK situation

Evidence-based medicine has been universally implemented in the UK as part of a new public management philosophy. Healthcare staff feel they must follow centrally determined protocols/pathways e.g. those from NICE.[1] Staff report feeling forced to offer treatment they know is wrong for individual patients in anticipation of sanctions if individual patient need is prioritised over guidelines for average patients. Meanwhile, evidence disproves the hypothesis that following national guidance maximises care quality[2,3] as healthcare costs and patient/family complaints[4,5] rise.

Could implementing evidence-based medicine be flawed?

Evidence-based medicine is based on an implicit assumption: patients with one disease are identical (barring minor random variation). Optimal care is defined by a single best treatment, which never changes once identified. Meta-analysis is powerful because it identifies this optimal treatment based on population-wide homogeneity.

However, this assumption is invalid. All sick people are unique individuals, cast from unique genetic blueprints undergoing constant variation in epigenetic expression, resulting from continuous dynamic interaction between person, and physical and social environment.[6] We suggest there are multiple optimal treatments for patients. This means meta-analysis points to a universally suboptimal

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treatment of 'least bad treatment' for most patients (see the fantasy scenario above).

The logical consequences of assuming all patients are homogenous include:

- Sanctions for offering alternatives to directed treatments
- Central research funds focus on politically 'important' areas
- Universal enforcement has utility
- Patient preference and professional judgement is harmful to individuals and the population
- Patients at extremes of the need spectrum suffer either excessive overtreatment or under treatment

The alternate prime assumption is 'All patients are heterogeneous', and its consequences are:

- Discouraging strict adherence to a single standard treatment
- Seeking local optimal solutions continues indefinitely – every new patient presentation is a novel event
- Tailoring treatment to patient needs based on patient preferences
- Encouraging professional judgement based on local experience of similar patients

How do we decide which would be a better basis for health policy?

A false assumption of patient homogeneity implies treatment failure is only possible by divergence from optimum treatment/care paths. Seeking better solutions is redundant as optimal paths are codified. However, as illness and the environment evolve, outcome quality inevitably declines. In contrast, falsely assuming heterogeneity is self-limiting as improving local solutions will gradually coalesce to a single global optimum. Therefore assuming heterogeneity is failsafe, but requires changes in thinking, professional practice and institutional governance.

Can the safe assumption be implemented?

Both the Evolutionary Algorithm,[7] and the Bees Algorithm[8] offer rapid convergence on local optima, and in combination avoid premature/false selection of suboptimal plateaux.

The Evolutionary Algorithm's starting point is the current status quo, i.e. accepting current national/international guides as local guidance. However, health professionals are required to amend local guidance to fit every current patient's needs. Both patients and clinicians already evaluate the treatment effect with different measures. Collating and summarising these evaluations by patient category statistically identifies changes that work best.

Emerging best-fit approaches become new local guidance for that patient group. This new local guidance becomes the basis for mandatory divergence once again, and this continues ad infinitum. This evolutionary approach could lead to blind alleys but this risk can be minimised by cross-fertilisation between different varieties of local guidelines

for the same conditions in different areas, i.e. the Bees Algorithm.

This Algorithm rotates a proportion of staff between different locations so they bring local best practice from other locations. Junior doctors and newly appointed health staff traditionally acted as scouts from other locations. The central role of designing care returns to patients and their clinical team, assuming both patients and clinicians are interested in healthcare quality and evaluating care outcomes.

Resources for an evolutionary approach?

This approach requires accurate reliable patient records of both characteristics and health history/care details. In the UK, GPs do this already, supplemented by secondary provider reporting. Additionally, it requires systematic outcome evaluation in near real-time. Health professionals have always had this duty, but including patients as formal partners is new. However, good professionals have informally always done this, so this merely assists in embedding current good practice.

Viability of evolutionary approach?

Evidence indicates such an evolutionary professional protocol for improving care merits consideration. Using the Bees Algorithm informally pre-1939 improved healthcare and developed new therapeutic agents. The Evolutionary Algorithm is used in Intermountain Health Care, Utah, USA. Using an evolutionary approach reduced death from chronic diseases by up to 5%, saved about 10% of annual costs over four years, improved staff productivity by almost 50%, and improved staff morale,[9,10] thus mandated divergence from national guidance saves lives, improves care and saves money, and is failsafe in the long term.

Conclusion

The claim that following national guidance maximises care quality and economy is disproven. An evolutionary system co-produces change based on professional judgement, with rigorous evaluation driving evolving local guidance based on open discussion of local comparative results and review, supplemented by external suggestions works.

In difficult economic times opting for professionally-led improving healthcare, rather than increasingly costly, care quality reducing protocol-based mechanistic services seems wise. Implementation is challenging but the alternative is declining public health for the foreseeable future.

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