BJPsych | The British Journal of Psychiatry (2026)
1–4. doi: 10.1192/bjp.2026.10676

Guest Editorial

A fourth pillar for evidence-based medicine: implications for psychiatry

Roz Shafran, Sarah Cohen-Woods*, Isobel Heyman*, Marcello Ienca*, Neil J. Sebire* and Tracey Wade*

Summary

It is time for evidence-based medicine to evolve and incorporate a fourth pillar of patient-level data. We describe what this pillar includes, how it integrates with existing pillars and its application to mental health treatment. We highlight key challenges and issue a 'call to action' for psychiatry and beyond.

Keywords

Evidence-based medicine; patient-level data; clinical decision-making; four pillars; EBM model.

Copyright and usage

© The Author(s), 2026. Published by Cambridge University Press on behalf of Royal College of Psychiatrists. This is an Open Access article, distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives licence (https://creativecommons.org/licenses/by-nc-nd/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided that no alterations are made and the original article is properly cited. The written permission of Cambridge University Press or the rights holder(s) must be obtained prior to any commercial use and/or adaptation of the article.

'Health data has the power to revolutionise care.'
Association of Medical Research Charities

Evidence-based medicine (EBM) has been defined for the past 30 years by the integration of three pillars – research evidence, clinical expertise and patient values.[1] When first introduced, this model was always intended to be dynamic. Nowhere is the need for evolution more apparent than in psychiatry where care is being transformed by rich, patient-level data, including genomics, digital phenotyping, neural recordings, real-time treatment response data, electronic health record trajectories and advanced analytic and predictive modelling approaches.

Increasingly, alongside bespoke data collection for research and trials, substantial volumes of personal health data are being routinely collected. Many patients are already embracing the use of platforms on which to store or share their information with medical professionals. This shift is central to National Health Service (NHS) England's 2025 Ten Year Plan, which prioritises leveraging technology to enhance healthcare, moving the nation from 'analogue to digital' healthcare.

These new personal digital data streams need to be integrated into clinical decision-making if care is to remain evidence-based. We propose that EBM should include a fourth pillar grounded in patient-level information drawn from routinely collected electronic patient records, standardised symptom scales, digital touchpoints, wearables and other patient-generated sources. These data could subsequently be integrated and analysed using advanced analytic approaches including artificial intelligence. This fourth pillar of EBM, integrated with the original three, is essential to prevent EBM from becoming outdated in guiding psychiatric practice and policy, and to drive improvements in healthcare implementation and innovation.

Data uses encompassed by the fourth pillar

The fourth pillar of patient-level data would include data used for four key purposes: (a) diagnosis, (b) prediction of illness trajectory, (c) treatment allocation and (d) response monitoring. Such data would include patient characteristics, response to prior treatments, clinical characteristics, imaging, symptom scales and genomics. Whole-genome sequencing is one of several emerging personal data sources contributing to clinical management in cancer,[2] but is also increasingly important in psychiatry (e.g. the use of polygenic risk scores with other clinical predictors within clinical prediction models).[3] Without incorporating these individual data, ideally contemporaneously when they are available, optimum care will fall short of evidence-based practice.

Fourth pillar definition

The fourth pillar of evidence-based medicine is patient-level data. It includes symptom measures, treatment–response trajectories, electronic health record data, genomics, imaging, digital phenotyping and other individual-level measures. Used alongside the other three pillars, these data support prediction of illness course, diagnosis, treatment selection and real-time monitoring of response.

Relationship with the other pillars

At present, patient-level information does not explicitly fall within any one of the existing pillars of the original model. The creation of a fourth pillar is viable only if it adds value to the EBM framework and its relationship with the other pillars is clear. The four pillars would function as follows:

(a) Best research evidence provides external, aggregate evidence derived from systematic research.
(b) Clinical expertise involves applying clinical skills and judgement to the individual patient.
(c) Patient values and preferences identify which treatment options are most acceptable to the individual patient.
(d) Patient-level data provide detailed, individualised information about a particular patient.

The fourth pillar clearly relies on the first pillar of research evidence to contextualise the data: for example, interpreting genomic data, treatment response data, routinely collected health data and outputs from advanced analytic or predictive models. However, it also ensures that the decisions are based on patient data rather than

*These authors contributed equally.

https://doi.org/10.1192/bjp.2026.10676 Published online by Cambridge University Press



Fig. 1 The four pillars of evidence-based medicine.

derived from aggregate data. It is also dependent on the second pillar of clinical expertise to apply the information to the patient, and the third pillar of patient preferences will be essential to apply patient-level data appropriately and in an acceptable manner. The fourth pillar therefore complements and is integrated with the others, as shown in Fig. 1.

Mental health as an exemplar

A fourth pillar highlighting personalisation and individualisation is applicable across all health domains. We argue that mental health is a leading exemplar of how patient-level data can, and should, be integrated within an updated model, for several reasons.

First, early response to treatment using regular progress monitoring and feedback is a strong predictor of the outcome of psychotherapies for eating disorders, anxiety and depression.[4] In the UK, regular progress monitoring by administration of a ten-item measure of depression and anxiety each session is mandated as part of the NHS Talking Therapies Programme. These are individual-level data points that generate clinically meaningful trajectories unique to that patient, and result in a review of clinical decision-making and reconsideration of treatment interventions rather than persisting with a course of intervention that is increasingly unlikely to benefit the patient. Evidence that sharing session-by-session data with patients improves outcomes is likely to drive increasing adoption of regular sessional data collection

The same use of individual response applies to medication. Failing to respond to the medication, or having intolerable side-effects, requires a revised clinical decision. Rather than relying solely on research data, the individual patient's data can be incorporated into advanced analytic or predictive models (including machine learning and other artificial intelligence-based tools, where appropriate) that use patient-level data to help guide subsequent practice, while still acknowledging the risk of bias: for example, generating personalised predictions about risk of non-response with an alternative medication, likelihood of symptom change and the pros and cons of the next-step intervention for the patient, based on their pre-existing pattern of response.

Second, patient-level data are already being used and aim to offer patients the right treatment, in the right dose, administered by the right therapist at the right time, enabling stratified care for depression.[5] Such personalised care involves the development of data-driven methods to guide diagnosis, treatment selection, outcome monitoring and treatment adaptation. A general principle is to leverage large data-sets from research on clinical samples to develop evidence-based tools to inform treatment decisions for the individual patient, demonstrating the interdependence of the pillars.

Third, consideration of clinician expertise and patient values is essential to properly determine the implications of patient-level data for the individual's specific context, because treatment choice itself significantly influences adherence and outcomes.[6] For example, patient perspectives on wishing to avoid the side-effect profile of medications need to be incorporated into the decision-making. Ignoring the availability of patient-level data on treatment response, combined with failing to use available dynamic prediction models and a lack of consideration for how the different pillars work together, result in suboptimal clinical decision-making for patients with mental health disorders.

But aren't we doing it already?

It could be argued that psychiatrists already use patient-level data in their clinical decision-making, and that it falls within 'clinical expertise' or the application of best research evidence. However, Sackett et al[1] considered clinical expertise to be the 'proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice' (p. 71), used to determine 'whether the external evidence applies to this particular patient'. Such clinical expertise reflects our personal judgement and biases and is not based on objective patient-level data. The goal of the fourth pillar is not to replace clinical judgement, but to enhance it. It could also be argued that such data fall under 'research', but this pillar refers to external, aggregate, systematic, reproducible research evidence derived from peer-reviewed literature and not idiosyncratic patient data. The fourth pillar therefore represents a distinct category of evidence that EBM is currently lacking and complements the existing pillars.

How does the fourth pillar fit with 'evidence-informed' practice?

The evidence-based model has been criticised for overemphasising hierarchies of evidence at the expense of other forms of empirical evidence, patient values and clinical judgement.[7] The term 'evidence-informed' practice has therefore been proposed as preferable, reflecting an approach in which research evidence is integrated with contextual knowledge to allow for individual variation, and to ensure that clinical decision-making remains person-centred.[8] Within this framework, the proposed fourth pillar of patient-level data can be understood as a component of contextual knowledge, incorporating practice-based evidence derived from routinely collected clinical data, with advanced analytic approaches, including artificial intelligence, enabling these data to be synthesised and interpreted in ways that meaningfully inform real-world clinical decision-making. Importantly, this refers to systematically collected and analysable patient-level data, rather than to anecdotal evidence or unsystematised clinical impressions.

Challenges

There are, of course, significant ethical, economic, legal and social issues raised by the use of patient-level data, big data, personalised medicine and the use of advanced analytic approaches, including

https://doi.org/10.1192/bjp.2026.10676 Published online by Cambridge University Press

artificial intelligence.[9] Access to accurate, affordable prediction models is an important challenge across medicine. Strengthening the completeness, interoperability and analytic readiness of routine clinical data-sets is essential to building personalised models. Well-curated data-sets from research trials could be used to extract the features needed to build the models, but the relative paucity of patients in trials, and important questions regarding generalisability to different contexts, and to different populations or ancestral groups, may limit their use.

To properly embed individual data prediction models within the EBM framework, better routine data collection methods are needed to enable features to be extracted. We also need better data-sharing across healthcare providers and trusts, and appropriate regulations that protect privacy and security while still allowing data-sharing and linkage within a reasonable timeframe. We need to reduce biased research data collection methods so that there is appropriate representation of currently underrepresented populations, as a part of ensuring that patient-level data are fit for purpose. Clinicians and researchers need to collaborate to ethically and safely share data-sets to build the models, and partnerships with clinician support platforms could be utilised to produce data that can guide practice in real time.

Challenges such as improving access to relevant tests, data sources and clinical support are fundamental to preventing the widening of health disparities. Developing reliable models from big data also depends on the availability of diverse and robust data-sets; current prohibitive costs and the narrow populations on which many models have been trained risk exacerbating existing inequalities.

The reality, however, is that large numbers of patients are already turning to artificial intelligence tools, uploading their private medical information, including diagnostic results, and seeking explanations or clinical opinions. They appear to be trying to apply the principles of EBM for themselves, but will often receive inaccurate and potentially harmful answers. It may also have implications they may not realise in relation to their data security and privacy. Other patients may have mistaken beliefs that anything they type or upload could directly be viewed and accessed by the public without their consent and so miss out on the potential benefits of artificial intelligence. Supporting patients to harness the benefits of easily accessible artificial intelligence and to interpret the results of the personalised output, while respecting the other pillars, is critical because failure to do so increases reliance on commercial artificial intelligence products that operate outside established clinical governance structures. These are important debates and it is clear that governance, transparency and patient education are of paramount importance in this rapidly evolving field, as well as being on the front foot in protecting patient data privacy and access to healthcare through legislation, including protection against genetic discrimination. However, they do not detract from the essence of our argument, that these advances need to be incorporated within EBM.

A call to action

Several changes are required to embed the fourth pillar in EBM in psychiatry:

(a) infrastructure: standardised, compatible systems for routine data collection that accurately record patient-level information and where data can be shared safely and securely but accessed easily without excessive bureaucracy;
(b) training: education of medical students about personalised medicine throughout the curricula when clinical decision-making and the role of the other pillars are being taught and not siloed;
(c) equity: ensuring that prediction models are developed across demographic groups, are accessible and do not increase health disparities;
(d) guidelines: explicit incorporation of prediction models and patient-level data into national guidelines and clinical pathways;
(e) regulation: governance systems currently leveraging big data and predictive modelling should bear in mind the role of patient-level data.

In conclusion, there is a revolution in medicine with the advent of data-informed and precision approaches, large-scale health data-sets, increased access to advanced analytic tools and the capacity to gather patient-level data. To modernise evidence-based medicine and optimise outcomes, our models must develop and recognise patient-level data as the fourth pillar of EBM. The task now is to invest in robust data infrastructures, ensure equity and provide clinicians with the tools to integrate these advances into everyday care. Without this evolution, the model will not fulfil Sackett's foundational aim of applying the best available evidence to the care of each individual patient.

Roz Shafran, PhD, FMedSci, UCL Great Ormond Street Institute of Child Health, University College London, UK; **Sarah Cohen-Woods**, PhD, Flinders University Institute for Mental Health and Wellbeing, College of Human Sciences and Culture, Flinders University, Adelaide, Australia; **Isobel Heyman**, MBBS, PhD, FRCPsych, UCL Great Ormond Street Institute of Child Health, University College London, UK; and Department of Psychiatry, University of Cambridge, UK; **Marcello Ienca**, PhD, Laboratory of Ethics of Artificial Intelligence and Neuroscience, Institute of Ethics and History in Medicine, School of Medicine and Health, Technical University of Munich (TUM), Germany; and Munich Institute of Robotics and Machine Intelligence, Technical University of Munich (TUM), Germany; **Neil J. Sebire**, FRCPath, GOSH DRIVE, UCL Great Ormond Street Institute of Child Health, University College London, UK; **Tracey Wade**, PhD, Flinders University Institute for Mental Health and Wellbeing, Flinders University, Adelaide, Australia

Correspondence: Roz Shafran. Email: r.shafran@ucl.ac.uk.

First received 17 Dec 2025, final revision 17 Feb 2026, accepted 16 Apr 2026

Author contributions

R.S., S.C.-W., I.H., M.I., N.J.S. and T.W. contributed to the conceptualisation, drafting and review of the manuscript and approved the final submitted version.

Funding

All research at Great Ormond Street Hospital NHS Foundation Trust and University College London Great Ormond Street Institute of Child Health is made possible by the National Institute for Health and Care Research (NIHR) Great Ormond Street Hospital Biomedical Research Centre. The views expressed are those of the author(s) and not necessarily those of the NHS, NIHR or Department of Health.

Declaration of interest

None.

References

1 Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ* 1996; **312**: 71–2.

2 Hodder A, Leiter SM, Kennedy J, Addy D, Ahmed M, Ajithkumar T, et al. Benefits for children with suspected cancer from routine whole-genome sequencing. *Nat Med* 2024; **30**: 1905–12.

3 Murray GK, Lin T, Austin J, McGrath JJ, Hickie IB, Wray NR. Could polygenic risk scores be useful in psychiatry? A review. *JAMA Psychiatry* 2021; **78**: 210–9.

4 Beard JIL, Delgadillo J. Early response to psychological therapy as a predictor of depression and anxiety treatment outcomes: a systematic review and meta-analysis. *Depress Anxiety* 2019; **36**: 866–78.

https://doi.org/10.1192/bjp.2026.10676 Published online by Cambridge University Press

5 Delgadillo J, Lutz W. Precision mental health care for depression. In *APA Handbook of Depression: Minoritized Populations, Lifespan Development, Assessment, and Treatment* (eds TM Olino, JW Pettit, RC Boyd, BC Chu, EP Hayden, DA Pizzagalli): 735–52. American Psychological Association, 2026.

6 Weyant C, Brandeau ML, Basu S. Personalizing medical treatment decisions: integrating meta-analytic treatment comparisons with patient-specific risks and preferences. *Med Decis Making* 2019; **39**: 998–1009.

7 Nevo I, Slonim-Nevo V. The myth of evidence-based practice: towards evidence-informed practice. *Br J Soc Work* 2011; **41**: 1176–97.

8 Miles A, Loughlin M. Models in the balance: evidence-based medicine versus evidence-informed individualized care. *J Eval Clin Pract* 2011; **17**: 531–6.

9 Brothers KB, Rothstein MA. Ethical, legal and social implications of incorporating personalized medicine into healthcare. *Per Med* 2015; **12**: 43–51.

https://doi.org/10.1192/bjp.2026.10676 Published online by Cambridge University Press