bmjmedicine

Check for updates

Case studies: a guide for researchers, educators, and implementers

Trisha Greenhalgh

Correspondence to: Prof Trisha Greenhalgh; trish.greenhalgh@phc.ox.ac.uk

Cite this as: *BMJMED* 2025;4:e001623. doi:10.1136/bmjmed-2025-001623

Received: 19 April 2025
Accepted: 21 July 2025

ABSTRACT

Case study is a widely used but poorly understood research method, conducted differently in different disciplines. This paper explores philosophical, theoretical and methodological issues in case study research and outlines how to conduct one. It offers preliminary guidance for policy makers on how to select and use case studies for learning and decision making. In social science research, a case study is a detailed, contextualised account of a clearly delineated, real world phenomenon, prepared prospectively using mostly qualitative methods. Social science case studies can be of various kinds (eg, theoretical or naturalistic, single or multiple, typical or extreme). A public health case study is a historical account of a health threat and how it was managed. An implementation science case study evaluates the implementation of an intervention (usually retrospectively), combining quantitative assessment against predefined objectives with a narrative of how the project unfolded. Educational case studies present real world topics as stories illustrated by data and prompt students to discuss these from different angles. Impact case studies summarise the societal impact of a research programme. Many accounts described as case studies are overly brief and superficial. The paper concludes with a call to improve the quality and consistency (and hence the usefulness) of case studies.

Introduction

Case studies are an established research method in many disciplines, including but not limited to the social sciences, public health, and implementation science. They are also increasingly popular in teaching and for summarising research impact. But the term "case study" is poorly understood and (even when used correctly) can mean different things in different contexts.

Cleland et al's definition of a social science case study is "an in-depth investigation of an organisation, an individual, a context or a phenomenon, single or multiple, set in a real-life context, bound by time and space, which aims to develop a deep comprehension of how the object of the research relates to its context."[1] Such research is usually conducted prospectively, as in Van der Westhuizen et al's account of how a health facility in a low resource setting implemented infection prevention and control practices, notably the wearing of face masks by staff and patients.[2]

In public health, a case study is typically a historical account of how a health threat (whether acute or chronic) emerged and was managed.[3] Tulchinsky covers many classic public health case studies in his book, including how public health physician John Snow curtailed a cholera outbreak in London by removing the handle of the Broad Street pump.[3]

In implementation science, a case study is (as defined by Beecroft et al) "a rich and detailed method of retrospective documentation to aid teaching, practice, and research."[4] An example is Getaneh et al's write-up of the implementation and evaluation of a multisite abortion service in Ethiopia.[5]

The term "case study" may also be used to refer to real world examples used in class teaching[6] or to structured accounts that summarise research impact.[7]

Research case studies tend to be published in qualitative or mixed method journals, but many case studies, especially for education and impact, are to be found in non-academic sources such as online repositories (see below for details). Table 1 offers a taxonomy of case study types relevant to healthcare.

Whatever their specific genre, case studies are usually presented in narrative (story) form, describing how something emerged and how its fortunes—for better or worse—unfolded over time. The hallmark of a genuine case study is detail: the authors commit to producing a full (warts-and-all) account of the case that juxtaposes multiple perspectives, including findings that resonate with the researcher's overall interpretation, and to disconfirming findings that challenge that interpretation. This attention to nuance has parallels to what qualitative researchers refer to as "thick description."[8] Rich detail distinguishes the research case study, based on the collection, analysis, and synthesis of empirical data, from the briefer and more narrowly biomedical clinical case report. This article discusses the research case study, not the clinical case report.

The narrative form allows a case study's authors to draw together, organise, and interpret multiple data sources efficiently and accessibly, producing

KEY MESSAGES

⇒ A case study is a detailed, holistic account of a real world phenomenon, written up as a narrative (story)

⇒ Case studies are usually but not always built from research data; they should be distinguished from brief clinical case reports

⇒ The purpose and format of case studies differ in the social sciences, public health, and implementation science

Table 1 | Taxonomy of case study types relevant to healthcare

Type	Purpose	Example
Case studies in social science research		
Naturalistic case studies	To generate deep understanding of a particular case for its own sake, with theory a secondary concern. Usually a single (n of 1) case, but can be multiple (collective) involving two or more cases. Asks "what is going on here?" Associated with Stake,[20] Merriam,[19] Flyvbjerg,[21] and Tsoukas.[22]	Infection prevention and control for tuberculosis and covid-19 in a South African hospital serving a deprived community (positive deviant single case study).[2]
Theoretical case studies	To generate generalisable knowledge about a phenomenon. Primary aim is to build and test theory across a purposive (small n) sample of cases. Asks "what is this a case of?" Associated with Yin[10] and Eisenhardt.[18]	Implementation of advanced practice nursing roles in France (multiple case study across five sites, purposively selected to test a pre-chosen theory).[14]
Case studies informed by realist evaluation	To examine the interaction between contexts, mechanisms (ie, the human reasoning triggered by an intervention) and outcomes. Asks "what works for whom in what circumstances?" A type of theoretical case study. Associated with Pawson.[47]	How and in what circumstances does WHO's Universal Health Coverage Partnership promote policy dialogue (a form of collaborative governance) in sub-Saharan African countries (multiple case study in six countries)?[11]
Public health case studies		
Historical breakthroughs	To describe a health crisis and how it was solved, perhaps celebrating a so-called lone hero.	John Snow and the Broad Street pump (waterborne nature of cholera).[3]
Policy evaluations	To evaluate a policy introduced to deal with a public health issue, often directed at reducing inequities).	Reducing consumption of trans fats in New York City.[30]
Outbreak analysis	To examine a cluster of cases in (eg, in a single locality) with a view to identifying the cause.	Fatal covid-19 outbreak linked to a choir practice early in the pandemic.[29]
Implementation case studies		
Evaluative case studies of implementation	To generate ongoing learning (formative evaluation) as well as final judgments and lessons (summative evaluation) on whether and why an intervention worked. A mostly quantitative logic-model evaluation (were predefined objectives met?) is combined with a mostly qualitative narrative component (what happened and why?).	Implementation of a comprehensive abortion service in a deprived locality in Ethiopia where complications after abortion were previously high (single site case study using 39 quantitative metrics plus qualitative methods).[5]
Case studies to develop theoretical knowledge about implementation	To produce generalisable statements about which implementation methods and tools are effective in implementing, spreading, and scaling up interventions that have already been shown to be effective somewhere.[4]	Testing the Population-Intervention-Environment-Transfer (PIET-T) framework to guide implementation and evaluation of tobacco dependence treatment guidelines in Vietnam.[37]
Descriptive case example(s) of implementation	To describe real world successes from which other teams can gain inspiration and practical guidance. Mostly found in the non-academic (grey) literature.	The PRIMASYS project prepared 20 in-depth case studies of high quality primary healthcare in low and middle income countries.[12 13]
Other case studies (examples)		
Educational case studies	To promote student learning, especially examining a topic in real world contexts from multiple angles.[6]Educational case studies should come with study notes and discussion prompts.	Some providers have so-called banks of case studies from which faculty can select (eg, for business (Harvard)[48] or global health (CABI)).[16 39]
Impact case studies	To provide an account of how an innovation or research discovery was taken up and the benefits (direct and indirect) that resulted. A type of summative evaluation.	The UK Research Excellence Framework (REF2021) offers a searchable database of over 6000 impact case studies, each describing the impact of a research project.[7 15]

CABI, Centre for Agriculture and Bioscience International; PRIMASYS, Primary Health Care Systems; WHO, World Health Organization.

a holistic account of what happened—which goes beyond a reductive "barriers and enablers" deconstruction of complex change.[9] To construct this narrative, researchers collect, synthesise, and present data from a range of sources including documents, interviews, ethnography (observation), and descriptive quantitative data (eg, waiting times, mortality rates). The narrative form is flexible, engaging, and open to multiple interpretations. A well written case study can thus persuade and inspire as well as inform.

Case studies, whether published in the academic or grey (ie, non-academic) literature, need to be approached with circumspection. Their provenance and purpose depend on who wrote them and why. They vary considerably in length, depth, and quality, although length and detail do not necessarily reflect rigor. The case study is an inherently unstructured form and does not lend itself to standardisation. Many true case studies are not titled or indexed as such and vice versa. Non-research case studies might be strong on description but contain limited data, a narrower range of data sources, and less explicit links between data and conclusions.

The next sections review the main kinds of case study used in health research, teaching, and dissemination; highlight some quality features; and offer preliminary guidance on how to select and use published case studies.

Case studies in social science research

Rationale

The common elements of a social science case study are shown in table 2, although a rapid review of 160

Table 2 | Elements of a case study in social science research

Element	Description	Example
Case study	The case addresses a clearly defined entity of interest (ie, it has a defined unit of analysis). This could be a programme, individual, group, social situation, process, organisation, event, technology, or other phenomenon.	Multiple case study of digitalisation and de-digitalisation in UK general practices.[17] The study was naturalistic (the primary goal was to describe and explain what happened, not to test theory).
A bounded system	The case is explicitly bounded by time, space, and activity, which helps to avoid scope creep and manage the various contextual influences (although the boundaries between the case and its context are often blurred).	12 UK general practices, studied from mid-2021 to end of 2023.
Studied in real world context	The case is studied in its real world setting with attention to context (including political, economic, social, technological, cultural, historical, and organisational).	Policy context: strong policy push for digitalisation. Temporal context: a 28 month period beginning about 1 year after the so-called disruptive innovation of wholesale shift to remote and digital forms of care in the early months of the covid-19 pandemic.
Studied in-depth using multiple sources of evidence	Detailed exploration of an issue using data collection and analysis appropriate to a chosen philosophical orientation (eg, constructivist, post-positivist, realist), demonstrating both depth and breadth of inquiry. Interpretation is key to the process, so reflexivity and checking back with participants are essential.	500 hours of ethnographic observation, 202 interviews across a range of participants and stakeholders, and four multi-stakeholder workshops (210 participants). Informed by Stake's naturalistic approach.[20] Interpretive techniques included research diaries and team discussions.
Case is selected and shaped to reflect the study's purpose	Sampling of cases, informants, and activities should reflect the study's purpose and focus. Progressive focusing is often needed to sharpen data collection; pursue themes that are typical, surprising, and varied etc; and avoid ending up with more data than can be analysed with the available time and resource.	Purpose: to study variation in the uptake, embedding, adaptation, and abandonment of remote and digital technologies and services. Case sites were selected for diversity in size, digital maturity, locality and population served. Themes identified in early data (eg, equity of access) were pursued through progressive focusing.
Findings are presented as an interpretive account	Actions and events are interpreted in context and recounted in narrative form (depicting unfolding over time), reflecting the boundaries of the case. Analytical themes are drawn together reflexively as the study progresses, producing a holistic interpretation that is refined and sense checked with study participants.	A familiarisation document was prepared for each case site to summarise the first six weeks of fieldwork.[49] Emerging findings were used to update these early summary documents and pursue priority themes in further depth. The near-final account was sense checked with staff and patients.
Theory is applied as appropriate	If the purpose of the case study is theoretical generalisation, explicit theory will guide the selection of cases and interpretation of findings.[10] If the purpose is naturalistic generalisation, theory will have a secondary role.[20]	In this naturalistic example, overall findings were theorised using diffusion of innovations theory.[38] Additional theories were applied as appropriate to subsets of data on quality of care,[50] patient safety,[51] equity,[52] continuity,[53] and technostress.[54]

Adapted from other published work,[1 55] using the Remote by Default 2 study of digital innovation in UK primary care[17] as an empirical example.

papers found that only a small fraction of studies described as case study research came close to meeting these criteria.[1]

Yin, whose distinctive methodology for case study research is widely used in healthcare contexts (box 1), suggests that the case study design in social science is particularly appropriate when the study[10]:

- seeks primarily to answer "how" and "why" questions (as opposed to "how many" or "was objective X achieved" questions);
- does not seek to manipulate the behaviour of those involved; and
- seeks to interpret the phenomenon in context rather than merely describe what was done (hence, is especially appropriate when the study topic is interwoven with processes, people, organisations, and policy).

Some cases are naturally well-bounded. A school, for example, is materially circumscribed, has a defined set of human actors (eg, pupils, staff, governors) and a history that began shortly before its founding day. But most cases are not so easy to delineate. A case study of a vaccination programme probably involves multiple organisations, numerous human actors of various kinds (including, perhaps, people protesting against the programme) and complex historical roots. The research team will need to make—and defend—a series of judgments about precisely what case they are examining. Even in cases that appear well-bounded, boundaries can be complex and shifting as organisations are restructured and people move into or out of roles. Hence, the question of "what is the case?" might be an issue of ongoing inquiry during the study rather than something firmly fixed at the outset. Another aspect of bounding the case is selection of an appropriate time frame including when the story begins and when it ends. These issues are matters of contextual judgment (some case studies unfold in weeks, others in decades).

The examples in table 1 are bounded variously by country and activity (policy making and governance[11] or primary care delivery[12 13]), organisation and activity (infection control[2] or abortion services[5] in a single hospital, implementation of advanced nurse practitioner roles across multiple hospitals,[14] or impact of research programmes in particular universities[15]), or community and activity (global health programmes in various local and regional settings[16]). The case in table 2, a multisite case study of digital innovation in UK primary care, is bounded by organisation and activity (general practices, digitalisation, and de-digitalisation).[17] All these examples were studied within a defined time frame.

Different kinds of social science case study serve different research goals, make different use

BOX 1 | KEY SCHOLARS OF CASE STUDIES IN SOCIAL SCIENCE RESEARCH

Robert Yin[10] (disciplinary background: cognitive and social science):

Yin has been highly influential in healthcare case studies, perhaps because his philosophical position (sometimes described as post-positivist) has some parallels with the objectivist (positivist) assumptions of biomedical science. Post-positivism acknowledges that objectivity in social science might be difficult but holds that we should strive to get as close to objective reality as we can through rigorous study design, testing theory across multiple cases (small n), and using multiple sources of evidence. To this end, Yin offers various techniques to improve the validity and reliability of the research process. Yin focuses on objective measurement and comparisons and places less emphasis than some other case study researchers on the subjective perceptions of research participants. Yin is also sometimes described as a social realist (ie, assuming an objective social reality but recognising that we might be unable to fully know it).

Kathleen Eisenhardt[18 56] (organisational studies):

Eisenhardt is also described as coming from a post-positivist or social realist perspective. She offers a detailed technique for building theory from multiple case studies (designed primarily for comparing how a theory fares across different organisational settings). She proposes a structured and systematic process, including analysis within and across cases, to identify patterns and develop testable propositions.

Robert Stake[20] (education and evaluation):

Stake approaches case study research from a very different perspective that is rooted in constructivism, a philosophical position which assumes that reality is multiple and that individuals' experiences and interpretations shape their world. Stake teaches that each case is unique and should be studied primarily for its own sake, rather than to develop or test theory. Rather than rigid and standardised data collection across cases, Stake advocates for inquiry that is naturalistic, curiosity driven, and responsive (adapting to the evolving context of the case). He considers that research participants' experiences and their (perhaps conflicting) interpretations are crucial to constructing the case.

Sharan Merriam[19] (adult education):

Merriam is also a constructivist, although her work also embraces a form of pragmatism (in the sense of seeking to orient case study research to producing findings that inform real world decisions, generate practical solutions and improve outcomes). Merriam emphasises the importance of rich description and of understanding how individuals construct meaning from their experiences. Like Stake, she recommends an inductive approach that is, allowing themes and patterns to emerge from data, unhampered by prior theory.

Haridimos Tsoukas[22 23] (organisational studies, philosophy of knowledge):

Tsoukas approaches case study from a deeply philosophical perspective influenced by the later Wittgenstein (who de-emphasised universal laws and showed how it is possible to reason from the particular to the general). Tsoukas' work has also been described as pragmatist and process oriented—that is, assuming that the world is dynamic and that knowledge is generated through human action. The key to case study analysis, suggests Tsoukas, is understanding how meaning is created in context (hence, researchers should engage with the particularities and complexities of a single case, paying close attention to the role of language, action and interpretation).

Bent Flybvjerg[21] (planning, especially of mega-projects):

Flybvjerg is also broadly pragmatist in his approach to case study. He emphasises phronesis (practical wisdom—the context dependent knowledge that is acquired in, and informs, practice). He proposes that detailed, context-rich analysis of specific cases helps us understand complex phenomena, especially how people acquire and apply practical wisdom (or not). He emphasises the importance of studying how values, power, and context influence practical action and decision making.

Ray Pawson[47] (sociology):

Pawson has been highly influential in health services research because of the popularity of his social (or scientific) realist philosophy underpinning realist evaluation. He considers that social programmes play out differently in different settings because different mechanisms are triggered. A mechanism is defined as how human actors draw on a programme's resources to achieve their goals. A realist case study, recommends Pawson, should seek to tease out the interaction between context, mechanism, and outcome.

Table 3 | Types of case studies in social science research

Criterion	Type	Descriptor
No of case studies	Single (n of 1)	A single case.
	Multiple or collective (small n)	Two or more cases.
	Nested (or embedded)	Multi-level study comprising one overarching case with multiple embedded units or components (eg, one hospital, several wards). A nested case study is usually single but can be multiple (with embedded units in each of several cases). A non-nested design is sometimes referred to as a holistic case study.
Goal of research	Exploratory (Yin)	A preliminary study to explore how and why a phenomenon unfolded in a particular way and produced a particular outcome(s). Exploratory case studies are about discovering and defining the research terrain, laying the groundwork for more focused inquiries. Can be single or multiple.
	Explanatory (Yin)	Following an exploratory phase, to analyse and explain what happened and why certain outcomes occurred in certain contexts. Usually involves testing and refinement of theory and identification of causal links. Usually multiple.
Role of theory	Theoretical (Yin), instrumental (Stake)	To provide insight into an issue, and especially to help refine a theory. Theory is of primary importance; the case is selected for its potential contribution to theory. According to Yin, theoretical case studies should be multiple. According to Stake, theory can be developed from a single case.
	Descriptive (Merriam), intrinsic or naturalistic (Stake)	To describe a particular event or phenomenon in rich detail and for its own sake. Theory used in secondary role. Usually single.
Sampling strategy	Representative or typical (Stake)	Selected to illustrate what generally happens within a broader category or population. Aims to provide insights into common patterns and characteristics. Often single.
	Particularistic (Stake)	Selected to describe a specific phenomenon or event in detail. The focus is on the unique aspects of the case. Almost always single.
	Paradigmatic (Stake)	Selected to illuminate a particular paradigm or theoretical perspective, and thereby develop new understandings, challenge existing assumptions, or contribute to broader theoretical frameworks. Usually single.
	Extreme (Stake)	Selected because it is unusual or unique in a key respect(s). Provides insights by examining outliers. Single. A variant is referred to as polar types, where cases at both extremes of a continuum (eg, high and low performers) are studied in a multiple design.
	Critical (Stake)	Chosen because it is expected to challenge or test a well-established or accepted theory. The case serves as a critical instance to see if the theory holds or fails in a specific context. Single.
	Positive deviant (no specific scholar)	An unusually successful example of a phenomenon from which others may learn or be inspired. Can be applied across different case study types.

Drawing on terms and definitions used by Yin[10], Stake,[20] and Merriam.[19]

of theory, and use different sampling strategies (table 3).

Defining quality—a question of philosophy

The philosophical positions of some leading case study researchers are summarised in box 1. While post-positivist case study researchers such as Yin[10] and Eisenhardt[18] aspire to meeting (or approaching) criteria such as disengagement (objectivity), minimisation of bias, precision, statistical significance, and reproducibility,[10 18] constructivist case study researchers such as Merriam[19] and Stake[20] focus on criteria such as authenticity, engagement, nuance, reflexivity, verisimilitude (ie, does the story ring true?), and the extent to which all perspectives have been captured.[19 20] Researchers working from pragmatist assumptions (eg, Flyvbjerg[21] and Tsoukas[22 23]) define quality in terms of the primacy of knowledge that arises from experience and is tied to action, and the ability of the case study to inform meaningful and ethical progress with a real world challenge.[21 22]

How to conduct a social science case study

As with other complex, real world tasks involving people in context (eg, raising a child), case study research cannot be done entirely by formula. Drawing partly on work by others,[10 19 20 24] some methodological steps are listed below. Noting Cleland et al's warning against an overly linear approach to the complex interpretive task of building a case study,[1] these steps should be seen as rules of thumb to be questioned, refined, and applied adaptively to circumstances. The case study used as a worked example in table 2, on digital innovation in UK primary care,[17] broadly followed these 10 steps (as described in a separate protocol paper[25]).

Step 1: Prepare and explore

Browse the literature and if it looks promising, do a scoping review. Visit candidate case study sites and talk to people close to the action. Confirm that there is an issue to be explored, that a case study design is appropriate, and that you would be welcome to gather data in your chosen site(s). Identify someone on-site who agrees to be your gatekeeper.[26]

Step 2: Formulate a research question

Clarify your purpose and how your research question addresses a gap in the existing knowledge base. Make your philosophical assumptions explicit (ie, decide, for the purposes of answering your research question, whether you are a positivist, post-positivist, constructivist, pragmatist, or other). Match your question and its philosophical underpinnings with an appropriate case study design and sampling strategy from the list in table 3. You may wish to align with a specific

case study researcher and follow their recommended approach (box 1).

Step 3: Define your case

Develop a broad outline of what organisation(s), groups, activities, and timescales you will include, and refine this as your data emerge. The question "What is at stake [for front-line actors]?" can highlight the core issues, conflicts, or important consequences associated with the case and hence guide you in sharpening your unit of analysis. See the bounded system element in table 2.

Step 4: Consider potential data sources

These sources might include documents (eg, plans, protocols, letters, reports, minutes of meetings, complaints, archival records), informal interviews (eg, preliminary phone calls), semi-structured interviews, focus groups, ethnographic observation, technology walkthroughs, and capture of informal material (eg, jokes). Ethnography often generates more useful data than interviews. If you plan to use a highly structured method designed to develop and test theory (step 8), you may need to standardise your data collection across case study sites.

Step 5: Gain access and pilot data collection

Meet with people in your study site(s) (not just top management), build relationships, and involve these individuals in refining the data sources and collection methods. Take advice from front-line actors on how to manage sensitivities, meet ethical requirements (eg, confidentiality, duty of care), and capture the perspective of marginalised groups.

Step 6: Collect data; focus progressively

Pull together an early summary; discuss it with co-researchers and participants (remember that case study requires interpretation, not just description). With attention to the purpose of the case study, select priority themes to pursue in depth. Your ongoing data collection should be shaped by how the study is unfolding, so as to fully explore issues that emerge as salient. Organise and index your data. Ensure that you are fully familiar with all key sources (eg, by repeated close reading and annotation of transcripts).

Step 7: Analyse and synthesise data

Analyse each data source separately and appropriately (eg, thematic analysis for interviews and field notes, descriptive statistics for quantitative data), and then bring these data together to construct your overall interpretation. For example, waiting list data will tell you that waits are increasing; interviews with staff and analysis of resource allocation documents will help tell you why; interviews with patients will capture the impact on lived experience. If your philosophical position is post-positivist or realist, follow an established method for categorising, tabulating, and formally combining your different data sources with a view to testing theory (in this case, for example, extending our theoretical knowledge about how waiting list management works).[10 18] If your philosophical position is constructivist or pragmatist, your analysis should be oriented to interpretation of the case for its own sake (ie, you will be interested primarily in this waiting list story and the implications for local actors).[19–22] Accordingly, extend your preliminary summary iteratively using the hermeneutic cycle (ie, weaving in each new data source to refine a picture of the whole).

Step 8: Theorise as appropriate

This step will differ depending on which philosophical approach you align with and which middle range theory you have chosen. Table 1 shows an example of a theory driven case study (guided by Yin's approach[10]) to test and extend a theory of implementation of advanced nurse practitioner roles across five study sites.[14] Table 2 shows an example of a naturalistic case study (guided by Stake's approach[20]), in which theory (in this case, diffusion of innovations applied to digital innovation) had a secondary role to help explain the varying fortunes of the 12 case sites.[27]

Step 9: Sense check with study participants

Front-line actors can help hone your interpretation of the case, although you may need to handle contested perspectives and attempts to censor unpalatable findings.

Step 10: Write up and disseminate

Prepare a master version of your case, plus summaries and adaptations for different audiences. Select a journal whose readership you want to influence and follow the instructions for authors. If appropriate, follow reporting guidance for case studies of complex interventions.[28]

Case studies in public health

Public health operates at the interface between medicine (eg, epidemiology, infectious diseases) and the social sciences (eg, human behaviour, culture, policymaking). Case studies in public health are often historical accounts (from the distant or recent past) of how health threats emerged and were managed. They are typically based on desk research using contemporaneous routinely collected data and commentaries, and they include both quantitative data and qualitative description.

Some examples of the genre depict a lone public health hero whose actions helped resolve a disease crisis of which the cause was somewhat of a mystery (Tulchinsky's book, for example, includes chapters on James Lind and scurvy, John Snow and cholera,

and Semmelweiss and hospital acquired infections[3]). Some contemporary public health case studies also have an air of mystery solving—for example, Miller et al explored the cause of a fatal covid-19 outbreak at a community choir practice in early 2020.[29] They used qualitative interviews along with data on case positivity and theoretical knowledge of how airborne particles travel in indoor spaces to provide early evidence of the likely airborne nature of the SARS-CoV-2 virus.

Many public health case studies feature the introduction and evaluation of a policy—for example, the attempt by New York City to reduce consumption of trans fats by regulating food outlets and running a public information campaign.[30] Case studies can be especially effective when examining policies intended to manage inequities, because the narrative form can illustrate the complex associations between structural factors (eg, housing, social exclusion), public policies (eg, welfare benefits), and health system factors (eg, accessibility, resilience, cultural competence), as illustrated by a study of indigenous groups from Brazil.[31] Many case studies in implementation science (see below) also involve public health interventions.

Case studies in implementation science

Rationale

Implementation science is the study of how to put into practice interventions that have already been shown (eg, in randomised controlled trials) to be effective in some settings.[32] In the early years of this developing field, emphasis was on producing abstracted advice in the form of guidance, tools, theories, models, and frameworks.[33] It is increasingly recognised that the real world effort of implementing an intervention in a new context is greatly aided by reading depth and detail of what happened when it was implemented somewhere else, since such accounts convey important aspects of context.[4]

Compared with the well-established methods used in the social sciences and public health, the methodology of case study in implementation science is in its infancy. Some authors have called for a more structured and standardised approach to methodology and reporting.[34 35] To date, implementation case studies have mostly been constructed retrospectively, although there is no reason why they should not be undertaken prospectively, thus allowing a more iterative and adaptive approach to data collection.

As shown in table 1, case studies in implementation science might be primarily concerned with evaluating the implementation of interventions in real world settings; developing the theoretical knowledge base of implementation science; or at a more basic and superficial level, describing examples of implementation projects, which are discussed further below.

Evaluating the implementation of an intervention

Case studies that systematically evaluate the success of implementation efforts use similar techniques to research case studies in the social sciences. Like case studies in the social sciences, those that evaluate the implementation of an intervention can be single, multiple, or nested. Their goal is twofold: to learn lessons which shape the project as it unfolds (formative evaluation) and, on completion of the project, to judge whether implementation objectives were met (summative evaluation).[36]

Data for the formative component tend to be from qualitative interviews or surveys (eg, of staff and patients' views). One key question is the extent to which the intervention was implemented as intended (fidelity) and what kind of adaptations were needed to align it with existing processes, pathways, and available skill mix. Data for the summative component tend to be quantitative and based on predefined criteria and indicators, perhaps arranged as a logic model (inputs, activities, outputs, outcomes, impacts).

For example, in a case study evaluation of a new comprehensive abortion service that was being rolled out across community settings in Ethiopia (see Evaluative case studies of implementation, table 1), 39 quantitative indicators were used for the summative component.[5] These indicators measured various inputs (eg, resources, staffing, guidelines, and protocols provided to each participating clinic), activities (eg, staff trained, planning meetings held), outputs (eg, patients treated, patients counselled and advised about post-abortion self-care, records completed), outcomes (eg, complications prevented, improved awareness of the service), and impacts (eg, reduced abortion related morbidity and mortality). A qualitative and survey (formative) component captured staff concerns (eg, high workforce turnover, equipment malfunctioning, drugs unavailable) and patient perceptions (eg, of felt stigma and discrimination). Combining these data allowed the evaluators to assess the fidelity with which each clinic was implementing the new service and the extent to which patients were benefiting (summative) and also explain why some clinics were failing to reach key targets (formative).

Developing the theoretical knowledge base of implementation science

Implementation science scholars have begun to use case studies to develop and test theories, models, and frameworks for improving the success of implementation efforts. This kind of case study is usually multiple (the approach is tested across a sample of cases); it is akin to the theoretical case study in the

social sciences (table 1) in that the cases are sampled primarily in order to test the theory or framework.

Parascandola et al, for example, tested a structured framework, PIET-T (Population-Intervention-Environment-Transfer process in the transferability of interventions) to guide the implementation and evaluation of an evidence based intervention (tobacco dependence treatment guidelines) in Vietnam (table 1).[37] They demonstrated added value from combining general knowledge (about the efficacy of these guidelines) with local knowledge (eg, about the service's existing perspective on this topic, the prevailing culture of tobacco use, the nature of local workflows and skill mix, the ability of local systems to capture data to monitor progress, and likely levers at local and national level for sustaining the intervention). By bringing general and local knowledge together, they were able to produce an adapted intervention with a high chance of being accepted and becoming embedded.

The authors mapped the PIET-T framework to a second case: cervical cancer screening by self-sampling in low and middle income countries,[37] although this so-called case was more a worked example from desk research covering dozens of settings than a true small n multiple case study. They make a plausible case for using this framework more widely to guide case selection, data collection and analysis in the study of transferability of health interventions. However, as these authors acknowledge, many questions remain unanswered about how frameworks like PIET-T should be applied in practice and what their limitations are.

Describing examples of implementation efforts

Descriptive examples aim to disseminate accounts of successful programmes (eg, primary care systems in low resource settings, as in the PRIMASYS project, see table 1) or, less commonly, unsuccessful ones.[12 13] They are usually found in the grey literature (eg, archives of non-governmental organisations or philanthropic funders) and may be of variable quality and depth. While not research, they can educate, inspire, and transmit practical wisdom (or, alternatively, provide cautionary tales).[38] However, these examples may have been written from a particular perspective (eg, the funder of a project, or an organisation's press office), hence may lack nuance and overlook the voices of marginalised groups. As case study research in implementation science develops, we should expect such descriptive examples to be informed by the principles described above (eg, including explicit metrics of success and detailed description of processes and challenges).

Other types of case study

Educational case studies

As noted above, case studies tend to include a range of data of different kinds and invite interpretations from multiple angles. When we interpret case studies, we draw on our own real world experiences as well as our theoretical knowledge.[4] This makes the case study (potentially at least) a powerful tool for learning, and explains why pre-formulated case studies are sometimes collated in so-called banks from which teachers can select examples appropriate for a class. Such educational case studies have been used for more than 100 years, especially in law, business studies, and (latterly) medicine.[6] Students should be guided to approach these case studies in ways that promote active learning (eg, imaginatively, critically, and with peers). Clear instructions, reflection exercises, and prompts for group discussion are essential.

Educational case studies in global health invite students to examine the multiple influences (medical, social, commercial, geopolitical) on a bounded health related topic, usually in low and middle income countries.[4 16 39] Case studies in sustainability offer a similar approach on environmental and planetary topics.[40] Many such studies are constructed around the United Nations' Sustainable Development Goals,[41] a vast global project that includes a complex set of indicators for measuring success.[42]

While the case study format is increasingly popular in education, case studies drawn from teaching banks may in practice be brief and somewhat stylised, lacking in rigour or depth, and (if they are reproduced in course reading lists year on year) out of date. They might unwittingly reproduce dominant and even colonialist framings of problems and their solutions. Accordingly, educators should be circumspect about off-the-shelf case studies and put effort into constructing their own. This approach will allow them to cover contemporary topics in imaginative ways and encourage students to critique the framings presented, question metrics, and consider whether any perspectives have been overlooked.[43]

Impact case studies

An impact case study is a narrative account of a research programme and the impacts (beyond academia) it has generated, including objective metrics (eg, improved health, raised public awareness, financial savings) and a narrative explanation.[7] This genre is popular in the UK because of research excellence framework assessments, in which case studies are scored by peers for significance (how important the impact is), reach (how far the impact has spread), and attribution (the strength of the causal link between the research and the impact claimed).

Since a substantial proportion of UK universities' income is calculated from impact case study scores, these cases are written to persuade. They are often rhetorically compelling and replete with numerical data, and reflect a series of judgments made by their authors about what kind of impacts are likely to score

Table 4 | Questions to ask when considering use of published case studies to improve understanding and inform decision making

Question	Notes
What problem or challenge am I seeking to address?	For example: Develop or refine policy, transfer an example of good practice to a new context, evaluate an existing initiative. What is the target population and preferred intervention or approach? What would success look like?
What evidence is there that a potential solution exists?	Consider: Has the intervention or approach been optimised (eg, in pilot studies) and empirically tested to determine efficacy (eg, in controlled trials)? If so, what were the setting(s) and what were the findings (including caveats)? Have these findings been synthesised into guidelines or protocols?
Do any case studies exist of attempts to implement the intervention in the real world? If so, to what extent can I trust them?	Favour in-depth evaluative case studies over brief descriptive examples (table 1). When assessing them, consider: ► What is their provenance (eg, who wrote and who sponsored the case study, and for what purpose)? ► Does the case provide both objective success metrics and rich qualitative detail of local contexts and how efforts played out? ► Were all key stakeholder groups included (especially of marginalised groups who may have been overlooked)? ► Is there evidence of critical reflection and interpretation (eg, questioning findings, seeking and explaining disconfirming data) rather than a more superficial account of "this is what we did"? ► Are specific claims (eg, lives saved) evidenced with data that are independently verifiable? ► Are there any interpretations that the authors have not considered? ► Overall, is the case plausible, coherent and balanced?
If the findings are trustworthy, what can I learn from them? To what extent are they transferable to my context?	What are the key features of your own setting, and what are the implications for efforts to transfer the intervention? Consider: ► The overall context (eg, political, economic, material, technological, geographical, cultural) ► The history and priority of the problem locally (including previous failed interventions and key competing priorities) and relevant path dependencies (eg, existing stakeholder relationships, supply chains) ► Workforce (availability, knowledge, skills) ► Stakeholder attitudes to the problem and the proposed intervention and how likely these are to shift ► Key barriers and levers as identified by local actors ► Ability of local data systems to monitor progress
What conclusions can I draw from this case study(ies)?	In summary, to what extent do you consider that: ► there is evidence that the intervention is effective; ► there are case study or studies describing its implementation in the real world; ► those case study or studies provide a trustworthy account of what happened in one context(s); and ► the findings are potentially transferable to your own context (perhaps with caveats).

well and how those impacts are best measured and framed. Because each case study is unique, however, standardisation of impact case studies has proved impossible.[44] Those who write (or read) impact case studies may be interested in the critical literature on this genre—for example, arguments that the potential financial gains and risks may be driving UK universities to conduct the kind of so-called safe research that generates compelling impact case studies (characterised by early, quantifiable, and clearly attributable impacts).[45 46]

Using case studies

The potential of case studies

Achieving change in healthcare settings is often difficult and complex. Case studies can be a powerful tool for those seeking to replicate good practice or implement tested solutions locally, but their value depends on how they are selected, interpreted, and applied. Potentially, case studies can provide rich, contextual insights which complement formal guidance; contribute to understanding of interventions, settings, and systems; help to identify and examine mechanisms (and hence, explain how and why outcomes occurred, not just what happened); and reflect how practical, on-the-ground realities affect the implementation of complex interventions.

The practical knowledge that can be conveyed in the case study format might be especially valuable in low resource settings where facilitators and mentors are unavailable.[4] Case studies are especially helpful in the early stages of policy design or when scaling or adapting interventions to new contexts (eg, across jurisdictions).

Different sampling strategies (table 3) can inform policy in different ways. Critical case studies, for example, can help confirm or refute general propositions. Extreme cases can highlight important exceptions. Multiple case studies (selected for maximum variation, as in the example in table 2) can show how an intervention performs across contexts. Lessons from case studies can inform cycles of design, testing, and refinement of interventions. Case studies can help to qualify or challenge other sources of evidence (eg, from quantitative performance metrics).

Generalisability of case study findings

The findings from a single case study (or small number of cases) are not statistically generalisable (a case study, however well-conducted, does not represent the wider world in the same way that a sample represents the population from which it was drawn). But case studies can be generalisable in two other senses:

- Heuristic generalisation. Case studies can generate rich narratives of particular phenomena (see Naturalistic case studies in table 1). If studied closely and critically, these narratives enable us to approach similar phenomena with wider vocabulary and greater practical wisdom than a novice would. Constructivist scholars (such as Stake and Merriam) and pragmatist scholars

(such as Flyvbjerg and Tsoukas) tend to emphasise heuristic generalisation.[19–22]

- Analytic generalisation. Case studies can generate theory, which can then be used to design and analyse other cases (see Theoretical case studies, Case studies informed by realised evaluation, and Case studies to develop theoretical knowledge about implementation in table 1). Positivist and post-positivist case study scholars (such as Yin and Eisenhardt) tend to emphasise analytic generalisation.[10 18]

Generalisability of case study findings is discussed in more detail elsewhere.[19 21]

Assessing the quality and relevance of published case studies

Not every case study needs to have followed a formal research methodology and been published in a peer reviewed journal to provide useful learning. Indeed, the word limits imposed by many academic journals mean that some of the most detailed and insightful case studies are to be found in the grey literature. But it is also true that case studies, whether single or multiple, can be compromised by sampling bias, limited or unrigorous data collection, uncritical interpretation, and even deliberate misrepresentation. Table 4 suggests some questions to ask about published case studies when considering their use as learning materials or models of good practice.

Conclusion

This paper has introduced various kinds of case study used in health research, teaching and practice. Well-established case study traditions in the social sciences and public health have been contrasted with the relatively new field of case study research in implementation science. While high quality examples exist in all these fields, superficial and descriptive examples often outnumber them. Publication guidance exists for some kinds of case study (focusing on social science examples),[28] but the guidance does not apply to all healthcare examples. In particular, further work is needed to develop explicit methods and standards for undertaking and writing up implementation case studies. In the meantime, the preliminary questions in table 4 are intended to guide policymakers and change agents who seek to use case studies to build their understanding and support decision making.

As Flyvbjerg notes, "a scientific discipline without a large number of thoroughly executed case studies is a discipline without systematic production of exemplars, and … a discipline without exemplars is an ineffective one" (page 219).[21] It is hoped that this paper will contribute to promoting the value of case study in research, education, and impact assessment and to efforts to enhance the quality and usefulness of case studies across these fields.

Acknowledgements Thanks to Rebecca Payne, Francesca Dakin, Eleanor Barry, Isabel Hanson, Lisa Hirschhorn, Andy Ratcliffe, and Judith Wasserheit for helpful comments on presubmission drafts of this paper, and to Jonathan Collett, Penny Hawe, Richard Riley, and two BMJ Medicine editors for comments on the initial submitted draft. The paper is much improved as a result of this feedback, although responsibility for errors is mine alone.

Contributors TG is the sole author and guarantor of the work. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Funding The author has not declared a specific grant for this research from any funding agency in the public, commercial, or not-for-profit sectors.

Competing interests The author has completed the ICMJE uniform disclosure form at www.icmje.org/disclosure-of-interest/ and declares: no support from any organisation for the submitted work; TG was part of the Triple C research team who developed publication guidance for social science case studies; no other relationships or activities that could appear to have influenced the submitted work.

Patient and public involvement No patients or members of the public were formally involved but those acknowledged above included non-clinical perspectives from people with lived experience of illness and participation in clinical research.

Provenance and peer review Commissioned; externally peer reviewed.

Data availability statement No data are available.

ORCID iD

Trisha Greenhalgh http://orcid.org/0000-0003-2369-8088

REFERENCES

1 Cleland J, MacLeod A, Ellaway RH. The curious case of case study research. Med Educ 2021;55:1131–41. 10.1111/medu.14544
2 van der Westhuizen H-M, Tonkin-Crine S, Ehrlich R, *et al*. Airborne infection prevention and control implementation: A positive deviant organisational case study of tuberculosis and COVID-19 at a South African rural district hospital. Glob Public Health 2024;19:2382343. 10.1080/17441692.2024.2382343
3 TulchinskyTH. Case studies in public health. London: Elsevier, 2017.
4 Beecroft B, Sturke R, Neta G, *et al*. The "case" for case studies: why we need high-quality examples of global implementation research. Implement Sci Commun 2022;3:15. 10.1186/s43058-021-00227-5
5 Getaneh BD, Worku N, Demissie KA, *et al*. Evaluation of comprehensive abortion care service in University of Gondar Comprehensive Specialized Hospital in Northwest Ethiopia: mixed case study design. BMC Health Serv Res 2025;25:449. 10.1186/s12913-025-12579-y
6 Herreid CF. Case study teaching. New Drctns for Teach & Learn 2011;2011:31–40. 10.1002/tl.466
7 Khazragui H, Hudson J. Measuring the benefits of university research: impact and the REF in the UK. Res Eval 2015;24:51–62. 10.1093/reseval/rvu028
8 Geertz C. Thick description: toward an interpretive theory of culture. In: The cultural geography reader. edn.: Routledge, 2008: 41–51.
9 Haynes A, Loblay V. Rethinking Barriers and Enablers in Qualitative Health Research: Limitations, Alternatives, and Enhancements. Qual Health Res 2024;34:1371–83. 10.1177/10497323241230890
10 Yin RK. Case study research: design and methods. London: Sage, 2009.
11 Robert E, Zongo S, Rajan D, *et al*. Contributing to collaborative health governance in Africa: a realist evaluation of the Universal Health Coverage Partnership. BMC Health Serv Res 2022;22:753. 10.1186/s12913-022-08120-0
12 World Health Organisation Alliance for Health Policy and Systems Research. Primary Health Care Systems (PRIMASYS). Geneva: World Health Organisation; 2017. Available: https://ahpsr.who.int/what-we-do/thematic-areas-of-focus/primary-health-care/primary-health-care-systems-primasys [Accessed 7 Apr 2025].

13 Sheikh K, Ghaffar A. PRIMASYS: a health policy and systems research approach for the assessment of country primary health care systems. Health Res Policy Syst 2021;19:31. 10.1186/s12961-021-00692-3
14 Schwingrouber J, Bryant-Lukosius D, Kilpatrick K, *et al*. Evaluation of the implementation of advanced practice nursing roles in France: A multiple case study. J Adv Nurs 2024;80:977–92. 10.1111/jan.15840
15 REF2021. Impact case study database. London: UK Research Excellence Framework; 2022. Available: https://results2021.ref.ac.uk/impact [Accessed 7 Apr 2025].
16 CABI. Global health case studies. Newcastle, UK: CABI. Available: https://www.cabidigitallibrary.org/journal/ghcs [Accessed 4 Apr 2025].
17 Greenhalgh T, Clarke A, Byng R, *et al*. After the disruptive innovation: how remote and digital services were embedded, blended and abandoned in uk general practice - longitudinal study. *Health Soc Care Deliv Res* [Preprint]. 10.3310/KRWS4334
18 Eisenhardt KM. Building Theories from Case Study Research. The Academy of Management Review 1989;14:532. 10.2307/258557
19 Merriam SB. 1985 The Case Study in Educational Research: A Review of Selected Literature. JET19:204–17. 10.55016/ojs/jet.v19i3.44167
20 Stake R. Case study research. Springer; 1995.
21 Flyvbjerg B. Five Misunderstandings About Case-Study Research. Qual Inq 2006;12:219–45. 10.1177/1077800405284363
22 Tsoukas H. Craving for generality and small-n studies: a wittgensteinian approach towards the epistemology of the particular in organization and management studies. 2009.
23 Tsoukas H. Don't Simplify, Complexify: From Disjunctive to Conjunctive Theorizing in Organization and Management Studies. J Management Studies 2017;54:132–53. 10.1111/joms.12219
24 Fàbregues S, Fetters MD. Fundamentals of case study research in family medicine and community health. Fam Med Community Health 2019;7:e000074. 10.1136/fmch-2018-000074
25 Greenhalgh T, Shaw SE, Alvarez Nishio A, *et al*. Protocol: Remote care as the "new normal"? Multi-site case study in UK general practice. NIHR Open Res 2022;2:46:46:. 10.3310/nihropenres.13289.1
26 Van der WaalK. Getting going: organizing ethnographic fieldwork. In: Organizational ethnography: Studying the complexities of everyday life. 2009: 23–39.
27 Greenhalgh T, Clarke A, Byng R, *et al*. After the disruptive innovation: How uk general practice embedded, sustained, blended and abandoned remote and digital services in 2021-2023. NIHR Journals Library, 2025.
28 Shaw SE, Paparini S, Murdoch J, *et al*. TRIPLE C reporting principles for case study evaluations of the role of context in complex interventions. BMC Med Res Methodol 2023;23:115. 10.1186/s12874-023-01888-7
29 Miller SL, Nazaroff WW, Jimenez JL, *et al*. Transmission of SARS-CoV-2 by inhalation of respiratory aerosol in the Skagit Valley Chorale superspreading event. Indoor Air 2021;31:314–23. 10.1111/ina.12751
30 Tan ASL. A case study of the New York City trans-fat story for international application. J Public Health Policy 2009;30:3–16. 10.1057/jphp.2008.42
31 SantosRV, WelchJR, PontesAL, *et al*. Health of indigenous peoples in brazil: inequities and the uneven trajectory of public policies. In: Oxford research encyclopedia of global public health. 2022.
32 Bauer MS, Kirchner J. Implementation science: What is it and why should I care? Psychiatry Res 2020;283:112376. 10.1016/j.psychres.2019.04.025
33 Wang Y, Wong EL-Y, Nilsen P, *et al*. A scoping review of implementation science theories, models, and frameworks - an appraisal of purpose, characteristics, usability, applicability, and testability. Implement Sci 2023;18:43. 10.1186/s13012-023-01296-x
34 Sibbald SL, Paciocco S, Fournie M, *et al*. Continuing to enhance the quality of case study methodology in health services research. Healthc Manage Forum 2021;34:291–6. 10.1177/08404704211028857
35 Crowe S, Cresswell K, Robertson A, *et al*. The case study approach. BMC Med Res Methodol 2011;11:100. 10.1186/1471-2288-11-100
36 Patton MQ. Qualitative research & evaluation methods: Integrating theory and practice. Sage publications, 2014.
37 Parascandola M, Neta G, Salloum RG, *et al*. Role of Local Evidence in Transferring Evidence-Based Interventions to Low- and Middle-Income Country Settings: Application to Global Cancer Prevention and Control. JCO Glob Oncol 2022;8:e2200054. 10.1200/GO.22.00054
38 Greenhalgh T, Robert G, Macfarlane F, *et al*. Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q 2004;82:581–629. 10.1111/j.0887-378X.2004.00325.x
39 Rhatigan J. Learning from case studies in global health. In: Systems thinking for global health: How can systems-thinking contribute to solving key challenges in global health. 2023: 285.
40 Corcoran PB, Walker * KE, Wals AEJ. Case studies, make-your-case studies, and case stories: a critique of case-study methodology in sustainability in higher education. Environmental Education Research 2004;10:7–21. 10.1080/1350462032000173670
41 United Nations. Transforming our world: the 2030 agenda for sustainable development. General Assembley 70 session; 2015.
42 Inter-Agency Expert Group SDGs — SDG Indicators. 2025 Available: https://unstats.un.org/sdgs/iaeg-sdgs/
43 Engebretsen E, Greenhalgh T. Why are the Sustainable Development Goals failing? Overcoming the paradox of unimplementability. Lancet Glob Health 2024;12:e1084–5. 10.1016/S2214-109X(24)00179-7
44 Grant J. What REF case studies reveal on measuring research impact. The Conversation; 2015.
45 Greenhalgh T, Fahy N. Research impact in the community-based health sciences: an analysis of 162 case studies from the 2014 UK Research Excellence Framework. BMC Med 2015;13:232. 10.1186/s12916-015-0467-4
46 MacDonald R. "Impact", research and slaying Zombies: the pressures and possibilities of the REF. IJSSP 2017;37:696–710. 10.1108/IJSSP-04-2016-0047
47 Pawson R, Tilley N. Realistic evaluation. London: Sage, 1997.
48 Harvard Business School. Cases. Boston, MA: Harvard Business Publishing (Education). Available: https://hbsp.harvard.edu/cases/ [Accessed 4 Apr 2025].
49 Greenhalgh T, Shaw SE, Alvarez Nishio A, *et al*. Remote care in UK general practice: baseline data on 11 case studies. NIHR Open Res 2022;2:47. 10.3310/nihropenres.13290.2
50 Payne R, Dakin F, MacIver E, *et al*. Challenges to quality in contemporary, hybrid general practice a multi-site longitudinal case study. Br J Gen Pract 2025;75:e1–11. 10.3399/BJGP.2024.0184
51 Payne R, Clarke A, Swann N, *et al*. Patient Safety in Remote Primary Care Encounters: Multimethod Qualitative Study Combining Safety I and Safety II Analysis. *BMJ Qual Saf* 2023.
52 Dakin FH, Rybczynska-Bunt S, Rosen R, *et al*. Access and triage in contemporary general practice: A novel theory of digital candidacy. Soc Sci Med 2024;349:116885. 10.1016/j.socscimed.2024.116885
53 Ladds E, Greenhalgh T, Byng R, *et al*. A contemporary ontology of continuity in general practice: Capturing its multiple essences in a digital age. Soc Sci Med 2023;332:116112. 10.1016/j.socscimed.2023.116112
54 Dakin FH, Hemmings N, Kalin A, *et al*. Technostress, technosuffering, and relational strain: a multi-method qualitative study of how remote and digital work affects staff in UK general practice. Br J Gen Pract 2025;75:e211–21. 10.3399/BJGP.2024.0322
55 Harrison H, Birks M, Franklin R, *et al*. Case study research: Foundations and methodological orientations. *Forum Qualitative Sozialforschung* 2017;2017:19.
56 Eisenhardt KM, Graebner ME. Theory Building From Cases: Opportunities And Challenges. AMJ 2007;50:25–32. 10.5465/amj.2007.24160888