Publishing Article 21 measures: an evidence-based assessment

for the Private Healthcare Market Investigation Order 2014

One of my early tasks as Chair of the Private Healthcare Information Network (PHIN) was to work with a wide range of stakeholders to develop a strategy to provide patients with much more comprehensive information about private healthcare services in the UK. That "Roadmap and delivery plan 2022-2026 for the Private Healthcare Market Investigation Order 2014" was approved by PHIN members and the Competition and Markets Authority (CMA) in summer 2022 and marked a significant milestone in the delivery of the Order. The document is available to read on the PHIN website.

That Plan was though just another step in the journey, and we have subsequently carried out an evidence-based assessment of what can meaningfully be published for each measure (the Assessment Project).

I am delighted to now be able to share the results of that process in this evidence-based assessment document. This is a major step forward in the ability of PHIN, the hospital providers and consultants to implement the proposals agreed in the roadmap and delivery plan. It sets out the recommendations made by our 'Task and Finish' Group with respect to PHIN's strategy and achieving compliance with the Order. It also incorporates comments and suggestions from the many stakeholders who engaged in our consultation process.

This has been a transformational piece of work and I am grateful to everyone who has been involved in this process and in particular the members of the Task and Finish Group. I believe this provides a firm foundation which will accelerate our activities towards the completion of the Order and the improvements in patient care that should result.

Our next steps include implementing insights provided by the CMA's Behavioural Sciences team, as well as working with the Patients' Association and other patient research organisations, on the presentation of our healthcare information to patients in ways that are most meaningful and helpful.

Jayne Scott
Chair
Private Healthcare Information Network

1.1 Background

The Private Healthcare Information Network (PHIN) is the official body for the collection and publication of data on private healthcare in the UK. We were mandated as the Information Organisation ('IO') for the Competition and Market Authority's (CMA) Private Healthcare Market Investigation Order 2014 ('the Order').

We are a not-for-profit body with no commercial interest beyond providing value-for-money services. Our primary aims are to serve the patient, support our stakeholders and deliver the CMA Order.

Article 21 of the Order sets out the CMA's expectations for the publication of information for a range of performance measures about surgical procedures carried out in private hospitals. We have made significant progress on delivering against these expectations.

We now need to build on what we have learned over the last five years, while incorporating new developments in healthcare and healthcare data which have emerged since the Order, to ensure we achieve delivery within the next four years.

We recognised in our 'Roadmap and delivery plan 2022-2026 for the Private Healthcare Market Investigation Order 2014' (the Plan)[1], published last year, that more work was needed to confirm what is required to achieve this and have carried out an evidence-based assessment of what can meaningfully be published for each measure (the Assessment Project).

The Assessment Project gathered evidence via consultation with subject-matter experts, desk-based research (comprising a review of relevant literature and NHS practice), and analysis of the data PHIN currently holds.

1.2 Purpose of this document

This document presents the results of the Assessment Project along with the recommendations for publication of each of the measures contained in Article 21 at national, hospital and consultant level (Section 1.3).

It sets out the general issues and recommended actions needed to address them (Summarised in Section 1.3 and set out in detail in Section 3). In Section 4, it also sets out the detailed rationale for the publication targets for each measure, and whether these differ from the original aspirations contained in the Plan, as well as explaining how the recommendations have been applied to establish the publication targets.

This document has been produced following conversation with our members and other stakeholders. We invited contributions, via a focused engagement and consultation process, to make sure there is sector-wide understanding of what these recommendations and guiding principles mean in practice and that the proposals have the support of our stakeholders. Thank you to everyone who has contributed to the development of this document.

1 https://bit.ly/CMAORDP This was approved by the CMA and PHIN's membership, and published in July 2022.

1.3 Recommendations for publication of the Article 21 measures

The recommended publication targets for each of the Article 21 measures at hospital, consultant and national level are set out in Tables 1-3. A summary of the issues and subsequent recommendations that have shaped these targets is in Table 4. We will continue to keep these under review in consultation with stakeholders.

At a high-level, the Assessment Project recommendations are that:

- Although publication in the public domain for the hospital-level metrics is essentially complete, we need to look at ways to improve compliance, including data presentation, coverage/participation and data quality, as well as adopt some minor, technical enhancements to specific measures.

- PHIN should publish nationally aggregated data about procedures, with the ability for it to be broken down to show how outcomes may vary for different patient groups.

- Information on all the Article 21 measures on consultant and hospital practice should be published on the restricted-access part of the PHIN website (the portal), so that consultants and hospitals can use the information to monitor and improve performance. Ultimately, this will benefit patients and consumers by improving the availability of data and transparency across the sector. It will also enable hospitals and consultants to benchmark their performance against their peers (for example to support their own clinical governance and quality improvement initiatives) and is a necessary step towards any wider publication.

- At consultant level, publication into the public domain of measures beyond volume, length of stay, patient feedback and links to registries is not currently recommended. This is because the remaining measures are not yet appropriate for use as publicly available comparators, for example because the quality and power of the data limits valid, statistical comparison. We will continue to keep these under review in consultation with stakeholders.

1.3.1 Table 1: Recommendations for Article 21 measures (Hospital-level publication)

Measure	Portal publication	Is the hospital complying with Article 21 of the CMA Order?	Publication of performance measure in the public domain.
a. Volume	By procedure for private activity (and NHS activity where available from external sources).	Activity data submission completeness and quality.	By procedure for private activity (and NHS activity where available from external sources).
b. Length of stay	By procedure for private activity (and NHS activity where available from external sources).	Activity data submission completeness and quality.	By procedure for private activity (and NHS activity where available from external sources).
c. Infection rates	Hospital-reported HCAI (separately, hospital and community acquired) and all SSI defined by UKHSA (including optionally reported).	Overall adverse event data submission completeness and quality (covers c, d, e, f, g and k).	Hospital-reported HCAI (separately, hospital and community acquired) and mandatory SSI as defined by UKHSA (hip and knee SSI) – no further breakdown by procedure.
d. Readmissions	Hospital-reported readmissions to the same site (and readmissions to other sites, e.g. to the NHS, if external data is available).	Overall adverse event data submission completeness and quality (covers c, d, e, f, g and k).	Hospital-reported readmissions to the same site – no breakdown by procedure.
e. Revisions	Not in scope[2]		
f. Mortality	Hospital-reported, in-hospital deaths (expected vs unexpected) and deaths from any cause within a defined period, if external data is available.	Overall adverse event data submission completeness and quality (covers c, d, e, f, g and k).	Hospital-reported, in-hospital deaths (expected and unexpected) – no breakdown by procedure.
g. Unplanned transfers	Hospital-reported unplanned transfer.	Overall adverse event data submission completeness and quality (covers c, d, e, f, g and k).	Hospital-reported unplanned transfers – no breakdown by procedure.
h. Patient feedback	Patient satisfaction and patient experience scores at site level.	Patient feedback data submission compared to overall activity volumes.	Patient satisfaction and patient experience scores at site level – no breakdown by procedure.
i. Registries and Audits	Link to external content for sites (where external data available).	Whether external content is available.	Link to external content for sites (where external data available).
j. Outcomes	Proportion of patients showing improvement, worsening or no change for all available PROMs.	PROMs data completeness and quality.	Proportion of patients showing improvement, worsening or no change for 6 high-volume PROMs.
k. Adverse events	Counts (and rates, where applicable) for hospital-reported 'serious injuries', 'never events' and 'returns to theatre'.	Overall adverse event data submission completeness and quality (covers c, d, e, f, g and k).	Counts (and rates, where applicable) for hospital-reported 'serious injuries', 'never events' and 'returns to theatre' – no breakdown by procedure.

2 Revisions are not in scope as it is not possible to estimate revision rates (which are sometimes estimated over a 5 or 10-year time frame using admitted patient care datasets (collated by PHIN and NHS Digital). Instead, registries with long-term data and clinical input to define instances of revisions are required. A prominent example is the National Joint Registry, which publishes revision rates for hip and knee replacement. PHIN can support the publication of revision rates by providing links to registry data.

1.3.2 Table 2: Recommendations for Article 21 measures (Consultant-level publication)

Measure	Portal publication	Is the consultant complying with Article 21 of the CMA Order?	Publication of performance measure in the public domain.
a. Volume	By procedure for private activity (and NHS activity where available from external sources).	Hospitals where the consultant works report the metric.	By procedure for private activity (and NHS activity where available from external sources).
b. Length of stay	By procedure for private activity.		By procedure for private activity.
c. Infection rates	Hospital-reported HCAI (separately, hospital and community acquired) and all SSI defined by UKHSA (including optionally reported).		Publication in later phase, contingent on data volume, quality and statistical validity.
d. Readmissions	Hospital-reported readmissions to the same site (and readmissions to other sites, e.g. to the NHS, if external data available).		
e. Revisions	Not in scope		
f. Mortality	Hospital-reported, in-hospital deaths (expected vs unexpected) and deaths from any cause within a defined period, if external data available.	Hospitals where the consultant works report the metric.	Publication in later phase, contingent on data volume, quality and statistical validity.
g. Unplanned transfers	Hospital-reported unplanned transfer.		
h. Patient feedback	Patient satisfaction and patient experience scores at site level.		Patient satisfaction and patient experience scores at site level – no breakdown by procedure.
i. Registries and Audits	Link to external content for consultants (where external data available).	Either directly from the registry and/or via consultant self-declaration.	Link to external content for consultants and self-declaration.
j. Outcomes	Proportion of patients showing improvement, worsening or no change for all available PROMs.	Hospitals where the consultant works report the metric.	Publication in later phase, contingent on data volume, quality and statistical validity.
k. Adverse events	Counts (and rates, where applicable) for hospital-reported 'serious injuries', 'never events' and 'returns to theatre'.		

1.3.3 Table 3: National-level publication

Measure	Publication of performance measure in the public domain (including filtering by patient variables) for each procedure.
a. Volume	By procedure for private activity (and NHS activity where available from external sources).
b. Length of stay	
c. Infection rates	Hospital-reported HCAI (hospital and community acquired) and mandatory SSI as defined by UKHSA (hip and knee SSI).
d. Readmissions	Hospital-reported readmissions.
e. Revisions	Not in scope
f. Mortality	Hospital-reported, in-hospital deaths (expected and unexpected).
g. Unplanned transfers	Hospital-reported unplanned transfers.
h. Patient feedback	N/A – relates to hospitals and consultants.
i. Registries and Audits	Link to external content relating to the procedure (where external data available).
j. Outcomes	Proportion of patients showing improvement, worsening or no change for 6 high-volume PROMs. Details of PROMs question responses.
k. Adverse events	Counts (and rates, where applicable) for hospital-reported 'serious injuries', 'never events' and 'returns to theatre'.

1.3.4 Table 4: General cross-cutting issues and recommendations

ISSUES	RECOMMENDATIONS
Issue 1: The scope of publication expected by the Order is very broad and presents significant practical challenges in terms of delivery. PHIN, on its own, cannot resolve all the issues identified by the Assessment Project due to the diverse, varied and interconnected nature of the Order's scope and requirements.	**Recommendation 1:** PHIN should continue to work closely with the CMA, the private healthcare sector, professional representative bodies and other interested parties (e.g. programmes in the NHS), on agreeing a pragmatic approach to define and refine what information can be published in a meaningful way to address the Adverse Effect on Competition (AEC) identified in the Order, building on the other recommendations set out in this document.
Issue 2: The CMA Order does not enable PHIN to collect information about NHS-funded care from providers. Presenting data on NHS-funded care and outcomes alongside information on privately funded care ('whole practice') would enable fair, valid and meaningful comparisons between hospitals and consultants. However, gaining access to NHS data of sufficient quality depends on factors outside PHIN's control.	**Recommendation 2:** The current phase of development should focus on information related to privately-funded care. However, information about NHS-funded care should continue to be provided where possible, as it is at present.
Issue 3: There are definitions in the Order (such as those relating to a consultant's registration body) and omissions (such as the exclusion of outpatient care) which limit PHIN's ability to publish fully comprehensive and meaningful information for the measures.	**Recommendation 3:** PHIN should work to clarify the definitions in the Order and should provide more contextual and descriptive material for patients and consumers, explaining when and how they can meaningfully use the information to support their healthcare choices. PHIN should also explain when and why it may not be possible to publish meaningful information.
Issue 4: Although publication for direct patient use remains an overriding aspiration, some measures are unlikely to be publishable in a way that allows meaningful comparisons for patients. There are a variety of reasons for this, set out in more detail under Issues 5-7.	**Recommendation 4:** PHIN should continue to publish meaningful information for patients for as many of the measures as possible, alongside more contextual and explanatory material for them. Where it is not yet possible to publish meaningful information for patients, PHIN should, as an interim step, make this available to consultants and hospital managers, who can correctly interpret and act on it to improve patient care. Such publication is an important mechanism to address the AEC by increasing transparency and the availability of data across the sector.
Issue 5: Not all measures in the Order were designed as quality indicators and should not be used beyond their intended purpose as this may lead to misinterpretation.	**Recommendation 5:** PHIN should build on its existing publication schedule by focusing on the further measures that enable meaningful comparison between hospitals and consultants.

ISSUES	RECOMMENDATIONS
Issue 6: Even where measures are valid as comparators, there may be statistical limitations (resulting from rare events and/or small numbers of patients) which can make it difficult to confidently identify relevant clinical variation in hospital/ consultant performance.	**Recommendation 6:** PHIN should initially publish information relating to all measures and procedures aggregated at a national level, with general breakdowns by broad patient characteristics. This will help to address the AEC by providing additional context for patients/consumers when making choices about their healthcare.
Issue 7: A large proportion of the variation in measured patient outcomes is likely due to differences in the characteristics of patients treated by different hospitals and consultants. Without adjusting for these differences in 'case-mix', publication of comparative information may be misleading. However, the ability to apply case-mix adjustment to data depends on two critical factors: having a statistically robust and clinically validated model; and access to data of sufficient quality to adequately support the model (see Issue 8). Given the absence of robust case-mix models suitable for the Article 21 measures, PHIN would need to develop them. This would be resource-intensive and would be unlikely to be completed within the timescales of the Plan.	**Recommendation 7:** PHIN should not aspire to produce complex case-mix models at present. However, where possible, it should publish more information to show the reported differences between patients seen by hospitals and consultants and enable that information to be filtered in a way which shows outcomes for different patient groups.
Issue 8: PHIN's ability to publish information is dependent on us receiving all the required data, and on it being accurate and complete. There remain significant gaps in reporting to PHIN which need to be addressed.	**Recommendation 8:** Data quality is the foundation of everything PHIN publishes, and we should continue to work closely with hospitals and consultants to improve the quality of inbound data.
Issue 9: PHIN currently defines procedures in a way which is intended to satisfy the needs of both patients and clinical audiences. However, clinicians find the procedure groups lacking in detail and patients find the current, technical definitions unintelligible and of limited use for navigating the information we publish.	**Recommendation 9:** PHIN should review its procedure definitions, recognising the dual requirements of fine granularity for clinical interpretation and broader aggregation to enhance patient understanding and engagement.
Issue 10: PHIN can publish information on the vast majority of admitted care activity in the UK private healthcare market. However, a significant number of providers do not yet fully comply with their legal obligations under the Order.	**Recommendation 10:** There should be an increased focus on publication of information on compliance with the obligations of the Order by hospitals and consultants. This will serve to motivate compliance and provide insight for patients.

2.1 Detailed and methodical assessment of the CMA's aspirations

The Assessment Project enabled detailed and methodical assessment of the aspirations set out for PHIN in the CMA Order. It considered how best to publish each of the CMA specified performance measures at hospital and consultant level, following the Publication Principles set out in the approved Strategic Plan and based on the principle that any information published in the public domain should be clinically and statistically valid, and meaningful[3] to patients.

Publication principles:

1) **Patient focus and benefit:**
   a) Patients should be consulted when developing the measures to ensure they are understandable and provide information that facilitates patient choice.
   b) The measures should be supported with contextual information and guides for patients.
   c) Information should enable comparison where possible and 'reassurance' when not. This includes exploring ways to gather and show NHS funded practice.

2) **Principles of the process and sequencing:**
   a) Publish the simpler measures before addressing the more complex ones.
   b) Consider publishing an interim version of a more complex measure where this is possible and helpful to patients.
   c) Aim to publish measures that show meaningful information across all settings, e.g. the initial site and any follow-up site.
   d) Apply case-mix adjustment where a validated model exists and where possible.
   e) Publish measures at hospital level first, then at consultant level.

3) **Principles for consultant-level publication:**
   a) Publish consultant level measures where there is a clinically meaningful validated method available.
   b) Publish high-level patient information supported by more detail for clinicians.
   c) Focus on private patient data first, then explore ways to gather and show NHS-funded practice.

4) **Approach to national/hospital publication:**
   a) Focus on private patient data first.
   b) Publish information to show nationally aggregated information about individual procedures to inform patient choice and facilitate shared decision making between clinicians and patients.
   c) Work with devolved nations to collect data on NHS-funded and privately-funded care.

3 In this document, 'meaningful' information refers to the publication of data that is understandable by both patients and clinicians and can inform patient choice, facilitate shared decision making or allow statistically valid comparisons between healthcare providers.

We used a variety of channels to gather evidence:

- **Consultation with relevant subject-matter experts.** We consulted with a range of external stakeholders via a series of formal 'Task and Finish Group' meetings held between July and December 2022. These included discussions with member representatives and other external stakeholders from consultant representative bodies, provider health organisations and NHS national programmes.

- **Research to determine what is standard publication practice in the NHS for equivalent measures.** We carried out desk-based research to identify standard NHS publication for each of the Article 21 Measures. In particular, we assessed whether there were precedents for publication for each of the measures at national, hospital or consultant level in the NHS.

  The principal sources included:

  - NHS Digital
    - Mortality – all causes
    - Emergency readmissions
    - PROMs
    - The NHS Case-mix Office
  - Public Health Scotland
    - Mortality (HSMR)
  - UKHSA (was PHE)
    - HCAI
    - SSI
  - Registries
    - National Joint Registry (NJR)
    - National Ophthalmology Database (NOD)
    - British Association of Urological Surgeons (BAUS)
    - British Association of Endocrine and Thyroid Surgeons (BAETS)
    - National Institute for Cardiovascular Outcomes Research (NICOR)
  - NHS England
    - Friends and Family Test
  - London School of Economics
    - PROMs (PHIN-commissioned research)
  - Care Quality Commission
    - Notifications

- **Research to identify any general, cross-cutting issues that could constrain or prevent our ability to publish meaningful information.** We conducted a review of existing literature to identify any broader issues which could impact data analysis and reporting and how these might be mitigated.

- **Examination of the data PHIN holds.** We analysed the data we receive to assess its quality and statistical power (largely driven by case volumes) and determine the extent to which it can be used to produce fair and meaningful comparative information for each of the measures at consultant and/or hospital level.

3.1 General

All of those consulted agreed that significant progress has already been made by PHIN and the sector to increase the availability of information on private healthcare. There was a shared aspiration to go further and, in particular, to publish information for direct patient/consumer use wherever possible. However, several issues were identified which have had an impact on this aspiration. Notably, for some measures, these represent significant limitations to reporting on the data and contradict the need for measures to be fair, meaningful, informative and not misleading.

A series of recommendations was developed to wholly or substantively remediate these issues.

3.2 Issues and recommendations

3.2.1 Issue one: The scope of publication expected by the Order is very broad and presents significant practical challenges in terms of delivery. PHIN, on its own, cannot resolve all the issues identified by the Assessment Project due to the diverse, varied and interconnected nature of the Order's scope and requirements.

The breadth of reporting required by PHIN under Article 21 is extensive compared to other organisations publishing similar healthcare related data. As it currently stands, PHIN has to publish detailed information across a range of performance measures on procedures carried out by any hospital or doctor[4] treating privately admitted patients[5] in the UK. No other single organisation publishes the same extensive range of information as those required by Article 21.

In the NHS, information is collected and distributed by several different agencies, each with different remits and responsibilities across the four home nations. In England, for example, PROMS have been collected by NHS Digital[6] and published by NHS England, while infection data is collected by UKHSA and activity volumes published by NHS Digital.

PHIN, by contrast, has an extensive UK-wide remit. This is particularly problematic when handling consultant-level data, where PHIN is required to capture and disseminate outcomes on all privately-funded specialties and interventions across the UK. This is rarely done elsewhere, and then with caution. For example, the NHS Clinical Outcomes Publication Programme (which covers national registries and audits) includes some consultant-level reports. However, these were developed for specific diseases and procedures, with high levels of clinical ownership. Publication into the public domain is limited, with more information available for professional users behind a secure log-in, as these publication programmes are largely aimed at professionals and technical experts, such as clinicians, researchers and health managers. They also include detailed case-mix modelling, again developed with significant clinical input, to ensure comparisons between individual clinicians are valid.

The Assessment Project concluded that while PHIN can build on these existing programmes, producing comprehensive, comparative information across the breadth and depth of coverage implied by the Order is challenging and will require a system-wide approach if it is to be manageable.

3.2.1 (a) Recommendation 1: PHIN should continue to work with the CMA, the private healthcare sector, professional representative bodies and other interested parties, taking a pragmatic approach to define and refine what information can be published to meaningfully address the Order's Adverse Effect on Competition (AEC).

PHIN should focus on the areas where it can provide most value to improve the availability of information to address the AEC. It should continue to work closely with other organisations, such as the clinical registries, NHS England, UK Health Security Agency (UKHSA), National Consultant Information Programme (NCIP) and Getting It Right First Time (GIRFT), to avoid duplication of effort around data collection and submission, methods production, and to avoid presenting potentially conflicting information.

4 The Order defines 'consultant' broadly to include any GMC-registered doctor who has performed a privately funded procedure.
5 There is no minimum threshold in the Order for the number of patients meaning a single patient treated in an NHS Private Patient Unit (PPU) automatically brings that hospital into scope.
6 Part of NHS England from January 2023.

This will support the eventual availability of a 'whole practice' view of activity and performance. It will also align with initiatives designed to bring about more efficient data collection as well as those aimed at enhancing patient safety, such as the response to the Paterson Review.

PHIN should continue to work with the CMA, the private healthcare sector, professional representative bodies and other interested parties (e.g. programmes in the NHS) to define and refine what information it is practical to publish in a meaningful way to address the AEC identified in the Order.

3.2.2 Issue 2: The CMA Order does not enable PHIN to collect information about NHS-funded care from providers. However, presenting data on NHS-funded care and outcomes alongside that relating to privately funded care ('whole practice') is required to enable fair, valid and meaningful comparisons between hospitals and consultants. However, gaining access to NHS data of sufficient quality is challenging and depends on factors outside PHIN's control.

Under the Order, PHIN can only collect information about privately funded care. However, the need for 'whole practice' views was recognised in the CMA's Private Healthcare Market Investigation Final Report [11.486], which stated that the published information should be:

> "...fully comparable with that collected by the NHS to allow the information organisation to report performance measures for the whole of consultants' practices, both NHS and private, since this is the relevant basis on which to judge performance".

Whole practice information is needed to show a consultant's overall experience. Publication of privately-funded activity alone risks underrepresenting the experience of those who also work in the NHS. The same also applies to hospitals, many of which perform significant numbers of NHS-funded procedures in exactly the same setting as their privately-funded activity. For both consultants and hospitals, this experience should be made visible to enable fair comparisons.

The Order did not give PHIN the power to collect information on NHS-funded care, presumably on the assumption that this would be provided by the NHS. However, accessing accurate information about NHS practice at the required level of detail in a timely way has proved a challenge, which significantly limits our ability to publish comprehensive and meaningful 'whole practice' information.

Moreover, there are quality issues with NHS data submitted to NHS Digital, such as incorrectly recorded procedure codes or patient information. Presented to clinicians on our portal, this can appear to be inaccurate collection and reporting on our part when in fact it is beyond our control.

The Assessment Project considered several options for mitigating this, but none was identified that would solve the issue consistently and reliably.

For example, it was considered whether NHS data could be sourced from existing registries, reports or other NHS publications. However, there is a high degree of variation in the data collected across different home nations, care settings and individual provider organisations, particularly when the data sources are voluntary. The information available also varies across different measures/ specialties. And, in addition, governance rules prevent some NHS organisations from providing us with information.

It was also considered whether PHIN could ask for self-declared NHS activity, but again there was no way to require that this information to be provided to PHIN, meaning it would likely vary by consultant, provider and specialty, resulting in fragmented information and missing the aim of capturing true 'whole practice' data.

3.2.2 (a) Recommendation 2: Although information about NHS-funded care should continue to be provided where possible as at present, this current phase of development should focus on information related to privately-funded care.

PHIN should continue to work with NHS England and other national bodies to explore how it might source data on NHS-funded procedures and adopt methods in line with NHS standards. However, its immediate and medium-term focus must be on meeting the CMA Order's requirement to produce information on privately-funded care.

PHIN should continue to present and enhance information on NHS activity where feasible, but the collection of comprehensive data on NHS-funded procedures should remain out if its scope until publication of information on privately-funded activity is complete.

In the meantime, PHIN should continue to explore interim solutions such as self-declaration of consultants' NHS-funded activity and provide signposts to existing sources of information on NHS-funded care.

3.2.3 Issue 3: There are definitions in the Order (such as those relating to a consultant's registration body) and omissions (such as the exclusion of outpatient care) which limit PHIN's ability to publish fully comprehensive and meaningful information for the measures.

The CMA Order contains specific constraints that limit our ability to produce meaningful and valid comparative data even when looking solely at privately-funded care.

Firstly, the Order excludes outpatient activity from the Article 21 Measures. This presents several challenges. A significant proportion of private treatments are now provided in an outpatient setting, and there is a variation in how providers classify procedures as either outpatient or day-case. From a patient's perspective there can appear to be little in the way of meaningful distinction between an outpatient and an admitted day-case procedure. This means we only capture a partial picture of activity, which can distort any comparisons between hospitals and consultants. As more and more procedures are performed in outpatient settings, an increasing number will be excluded from our reporting under the Order. To ensure patients have a complete picture and that the information we publish is meaningful, we will have to work closely with the CMA and other stakeholders to agree which procedures should be reported to PHIN regardless of their setting.

Secondly, because the CMA investigation and Order focused on surgical procedures, we currently do not collect or produce information on non-surgical activity, such as medical, psychiatric, midwifery and fertility services.

Thirdly, the Order defines consultants as practitioners who are registered with the General Medical Council, meaning it excludes interventions delivered by practitioners with admitting rights who are registered with other professional bodies such as the General Dental Council. PHIN is unable to publish information about these practitioners even though they carry out significant volumes of privately-funded procedures.

Because of the above limitations and more generally, we need to be clear about how the data we collect and the information we publish can and cannot be used by patients to meet their individual needs.

Patients may seek information on private healthcare for a variety of reasons. Some may want clarity on fees, others may want information on how long they may need to stay in hospital for a particular procedure, while some may simply want to know which clinician or hospital offers the intervention they need.

There are also patients who may have more complex needs, for example seeking advice about symptoms prior to diagnosis.

It is important that we make patients aware that the information we publish is not a substitute for seeking direct clinical advice. Individual symptoms can have many different causes and there may be several different treatment options for each diagnosis. It would not be appropriate for us to direct patients to a particular specialist based on their symptoms and it would not be appropriate to guide them to a particular treatment based on their diagnosis.

3.2.3 (a) Recommendation 3: PHIN should work to clarify the definitions in the Order and should provide more contextual and descriptive material for patients and consumers, explaining when and how they can meaningfully use the information we publish to support their healthcare choices.

PHIN should work with the CMA, providers, consultants and patients to agree what should be covered by the Order to ensure there is consistent reporting. The initial focus should be on agreeing which procedures, if any, should be excluded because they are genuinely considered 'outpatient-only' and then to ensure that providers send information to PHIN on all the procedures in scope.

At the same time, PHIN should provide guidance for its users on what the data is intended to cover, including how its quality limits certain forms of analysis and interpretation.

In line with the Order, PHIN should be explicit that it does not collect or report data on outpatient activities or interventions and care provided by non-GMC registered clinicians.

PHIN should also provide clear definitions and explanations of the appropriate conclusions that can be drawn by the user, including clearly stating which forms of interpretation are inappropriate. PHIN should make it clear that the information published is not intended as a substitute for clinical advice on diagnosis or treatment.

3.2.4 Issue 4: Although publication for direct patient use remains an overriding aspiration, some measures are unlikely to be publishable in a way that allows meaningful comparisons for patients for a variety of reasons set out in more detail under Issues 5-7.

Article 21.4 of the Order sets the expectation that PHIN should publish information in "a format that enables comparison of the data and is likely to be comprehensible to patients" when they are considering private healthcare. PHIN's aim remains to publish all measures in the public domain by procedure, and at both hospital and consultant level where it is clinically meaningful and informative for patients. The Assessment Project confirmed widespread support for this shared aspiration. However, it also identified several issues which may limit our ability to put information into the public domain.

Valid interpretation of the information provided on each measure can depend both on sophisticated technical/clinical knowledge and an understanding of the context. Without these, there is a real risk those using the information will be misled rather than informed. This would undermine PHIN's credibility as a trusted source of information. One of the biggest risks with publishing inaccurate or incomplete information for the public is unfair representation which could ultimately result in reputational and financial losses for the hospitals and consultants concerned.

For example:

All procedures have a baseline level of risk due to unavoidable, intrinsic factors. There is a chance of an adverse outcome, including patient death, for any given procedure even under the best possible circumstances. If the baseline risk of death for a particular operation is 1%, on average, one patient in every 100 operations would not be expected to survive and patient deaths at this rate may not indicate anything negative about the care received[7].

If five surgeons each perform 20 identical operations, with all things being equal, it is likely that one of the 100 patients will not survive. This means that one of the consultants will have a 5% death rate (1 of their 20 patients died) and the other four consultants will have a 0% death rate.

Publishing these rates without qualification and caveats would be misleading, as it may have been entirely down to chance which particular consultant had the (expected) death. It would be unfair and misleading to suggest that patients should avoid this consultant because they are 'less safe' than the others, or that the other surgeons are better. If this procedure is only conducted in small volumes (see issue 6), then even with detailed information on case-mix, any comparisons between individual surgeons will always be statistically underpowered.

It was therefore agreed that PHIN should only publish information that is likely to inform and be understood by its intended audience.

We will continue to provide as much background information and as many caveats as possible for those using our data. However, in our experience, even when caveats are provided, some users may use data inappropriately. For example, some have tried to use the raw numbers on adverse events to rank hospital performance, despite the fact that we state the data should not be used this way.

As discussed elsewhere in this document, there are also several important limitations on the data and measures we collect.

Firstly, some contextual information that is required for publication is not available. For example, information on whole practice at both site and consultant level and information on the different characteristics of patients seen by different hospitals and consultants, or 'case-mix adjustment' (Issue 7).

Secondly, there are some measure specific limitations which impact appropriate use of the data.

In some instances, the measure itself is not intended for use as a comparative metric (Issue 5) and is not recognised for use as a clinically meaningful indicator of hospital or consultant performance quality. For example, 'never events' are serious safety incidences that should not occur if the appropriate preventative measures have been implemented. However, 'never event' reporting is not designed for comparison of quality. It is intended for use at individual sites to inform quality improvement and foster transparency. It has been shown that using such measures as comparative quality indicators acts as a 'perverse incentive', which reduces transparency and drives down the availability of information.

7 However, reasons for the death would still need to be investigated to confirm that there were no avoidable causes.

Some data also lacks statistical power, for example when relevant events or incidents for a measure are rare and occur in small volumes, which makes it difficult, if not impossible to produce meaningful comparisons which are not misleading (Issue 6). This makes it impossible to draw statistically valid comparisons between hospitals or clinicians from a recognised external benchmark (Issue 6). Measures for mortality can fall under this grouping as death is a rare complication of most elective care procedures conducted in the private healthcare sector.

In addition, there are instances where we lack the models and/or data to enable effective case-mix adjustment (Issue 7) because most models have been developed for a specific disease or procedure.

The first two issues are outside of our control since they relate to intrinsic properties of the measures and the real-world levels of activity in private healthcare, which may never reach appropriate thresholds to enable publication of valid comparisons. The third issue is only partially within our control but is dependent on availability of the (potentially significant) resources necessary to develop case-mix models and on the provision of data on NHS activity (Issue 2) to ensure any comparators fairly include 'whole practice'.

Bearing all of this in mind, the release of specific, measure-related information at hospital or consultant level into the public domain should be treated with caution. In some instances, it would be more likely to mislead consumers than inform them.

However, PHIN remains in the unique position where it can collect information across the UK private healthcare sector, which can be presented to audiences other than patients to address the AEC. The CMA acknowledged that even where public domain publication is not appropriate, there are other channels PHIN can use to further the aims of the Order.

For example, we can make information available to hospitals and consultants which enables them to benchmark performance against their peers. This will ultimately benefit patients. It will also promote transparency and competition within the sector while facilitating improvements in clinical quality and minimising unwarranted variation.

We can also help GPs and other patient advisors (such as insurers) understand and use the data to improve patient choice.

The Assessment Project recognised that it is sometimes potentially 'safer' to publish information for technical and professional users, who have a deeper understanding of how to interpret and contextualise it, rather than release it directly to the public. However, we need to make it clear that the responsibility for correct interpretation and use of the data rests with them. For example, it will be the responsibility of the hospitals and consultants to investigate whether variance is genuinely due to a difference in clinical performance or to other factors such as data quality or clinical complexity, and to then take appropriate action.

As some of the issues outlined in this document are addressed across the entire healthcare sector, PHIN's approach will evolve to widen the availability of information for patients. As data quality improves, there will also be scope to explore collaboration with academic partners or institutions and gain insight into the drivers of variation in quality. This will also include drawing up data access agreements with associated information governance requirements. Publication in academic journals will provide another route to increase the availability of information about private procedures by further disseminating the insights gained from PHIN data.

3.2.4 (a) Recommendation 4: PHIN should continue to publish meaningful information for patients for as many of the measures as possible, including more contextual and explanatory material. Where it is not yet possible to publish meaningful information for patients, PHIN should, as an interim step, publish information for consultants and hospital managers, who can correctly interpret and act on it to improve patient care. Such publication is an important mechanism to address the AEC by increasing transparency and the availability of data across the sector.

PHIN should enhance all of its publication channels, for example to include more sophisticated breakdowns of the information, time series, more contextual information, and broader coverage, both within and across the measures to help meet user needs.

Research and consultation with stakeholders confirmed that it is not always appropriate to use some Article 21 measures as direct indicators of hospital or consultant quality for the reasons outlined in 3.2.2. This has also been acknowledged by the CMA.

Given the risk that this data could mislead rather than inform patients, it is recommended that we take a pragmatic approach to publication of the measures for a general audience. The implications for the individual measures are outlined in detail in the main technical document.

To mitigate any impact this will have on delivery of the Order, we plan to make further enhancements to the publication of all Article 21 measures information on the restricted-access PHIN portal, where it can be used first by hospitals and consultants. Ultimately, this will still benefit patients and consumers by improving the availability of data and transparency across the sector. It will also enable hospitals and consultants to benchmark performance against their peers.

This pragmatic approach is an essential step towards wider publication. It remains our aspiration to publish information for use by patients. However, this will be contingent on factors such as the quality and statistical power of inbound data.

PHIN will make more material available to explain how the information we publish can be used to support patients and consumers in their choice of consultant and healthcare provider. The strengths and weaknesses of the information will also be clearly communicated to help ensure its appropriate use.

PHIN currently publishes information across two domains[8]: the 'public domain' (the PHIN website) which is available to everyone with no log-in requirements and the 'portal domain' (the PHIN portal), which requires authorised access to more granular information for hospitals and consultants.

PHIN should aim to publish information across the measures into the portal domain (subject to information governance constraints) as soon as possible. This would enable consultants to see all the information we have received about their private practice from all providers in the portal and should increase their engagement with the data (e.g. by providing information they can use for their appraisals), improve transparency and facilitate improvements in data quality.

PHIN should also provide Responsible Officers, Medical Directors, etc with access to this information to give them an insight into hospitals' and consultants' overall private practice. This will enable them to identify potentially outlying performance (good or bad) to inform data quality initiatives. Ideally, information would also be shared between providers, perhaps via a 'quality forum', so that hospitals and consultants can collectively review performance across the private sector.

It is anticipated that increased engagement from hospitals and consultants with the data published on the portal domain will lead to improvements in data quality, which will facilitate the development of meaningful information which can eventually be published on the public domain.

This approach will continue for the remainder of the Roadmap and Delivery Plan.

3.2.5 Issue 5: Not all measures in the Order were designed as quality indicators, and should not be used beyond their intended purpose, as this may lead to incorrect conclusions.

As mentioned in 3.2.4, there are several Article 21 measures which cannot be used as direct comparative quality indicators but are often published elsewhere to foster a culture of transparency and openness in healthcare.

8 The public domain – information available to anyone, with no requirement for logon, comprising:
• Publication of information into the public domain (phin.org.uk) for direct patient use. PHIN's publication channel for patients and consumers is the consumer-facing section of the website, available to all without the need to a log-in. It provides performance information on hospitals, consultants and procedures, as well as other information to help inform patient/consumer choice.
• Publication of information into the public domain for use by clinicians and other third parties. This area currently consists of a series of publicly available datasheets, available to all without any need to log-in, that provide more detailed and technical performance information on hospitals, consultants and procedures. The datasheets also contain contextual information and caveats to help ensure only appropriate conclusions are drawn from the data. This information is supplemented with information about the processes by which the data is collected and processed.
The portal domain – information available to a restricted audience and requires a user account and log-in to access:
• PHIN's secure publication route for providers and consultants. It requires authorised access and provides b more granular/patient level information against each of the measures, which is not suitable for publication in the public domain.

For example:

- The NHS publishes 'never events' at hospital level but makes it clear that these should not be used as a comparative measure of hospital performance. The rationale for this is that comparisons and linkage to financial penalties could encourage a 'blame culture' and introduce perverse incentives about openness which would ultimately lead to lower levels of reporting and negative implications for the quality of care (https://www.england.nhs.uk/wp-content/uploads/2020/11/Revised-Never-Events-policy-and-framework-FINAL.pdf).
- The Summary Hospital Mortality Indicator (SHMI) shows mortality rates in NHS Trusts, but its guidance states that it is not a measure of quality of care. https://files.digital.nhs.uk/BB/F7852B/SHMI%20interpretation%20guidance.pdf).
- The Friends and Family Test is intended to improve patient experience, but NHS England clearly states that it is not designed to make comparisons across organisations. (https://www.england.nhs.uk/wp-content/uploads/2022/12/FFT-IP-Oct-22.xlsm)
- The CQC uses mortality rates and feedback from people who use services to generate insights about providers of care. However, it is clear that these insights on their own should not be used to make judgements on quality. (https://www.cqc.org.uk/what-we-do/how-we-use-information/how-we-use-information)

Additionally, not all measures are relevant at the procedure, consultant, or hospital level. Some only apply at a system level and are largely independent of the particular procedure being performed. It would be unfair to attribute blame by association for adverse outcomes. When looking at hospital-acquired infections, for example, the risk may relate to the environment, processes of infection control and staff compliance, rather than the individual clinician or procedure being performed. There are separate, robust, parallel processes to monitor consultant performance and to identify any issues which are beyond the scope of the Order (Issue 1). Many of these involve registries that are specialty, disease, or procedure specific, such as the National Endoscopy Database which assesses individual consultant performance against multiple measures including colonoscopy completion rates and adverse events.

Crucially, these registries include collection of detailed patient information meant to reflect differences in case-mix for specific specialties, diseases, or procedures. As outlined in 3.2.1, it is not feasible for PHIN to collect such detailed data for every procedure in the private healthcare sector.

3.2.5 (a) Recommendation 5: PHIN should build on its existing publication schedule by focusing on the further measures that enable meaningful comparison between hospitals and consultants.

See the detailed recommendations for publication of each measure in Tables 1-3.

3.2.6 Issue 6: Even where measures are valid as comparators, there may be statistical limitations (resulting from rare events and/or small numbers of patients) which mean it can be difficult to confidently identify relevant clinical variation in hospital/consultant performance.

Care must be taken to ensure comparisons are valid and that false comparisons are avoided. The standard, validated, approach adopted by the NHS is the statistical analysis of outcomes data to identify where there is a significant deviation (outliers) from what is expected[9].

Where values fall within expected limits, they should not be used to make comparisons between different hospitals and consultants, as the data shows they are statistically indistinguishable (e.g. Proudlove et al.[10]). Even where it can be confidently stated that values appear outside expected limits, this may not indicate that a hospital or consultant is clinically performing exceptionally well or badly There may be other factors outside their control which are influencing outcomes (Issue 7 where the impact of case-mix variation is discussed).

The Children's Heart Surgery Outcomes Register emphasises these points by stating that:

> "A hospital's survival rate should only be compared to its own predicted range. It is not valid to directly compare survival rates between hospitals."

9 For example the National Joint Registry and the Children's Heart Surgery Outcomes Register.

10 Nathan C. Proudlove, Mhorag Goff, Kieran Walshe & Ruth Boaden (2019) The signal in the noise: Robust detection of performance "outliers" in health services, Journal of the Operational Research Society,70:7, 1102-1114, DOI: 10.1080/01605682.2018.1487816

Nevertheless, reporting that performance falls within or outside expected limits can serve to reassure patients and consumers that the treatment provided by hospitals or consultants is in accordance with expectations or to alert them that it is not.

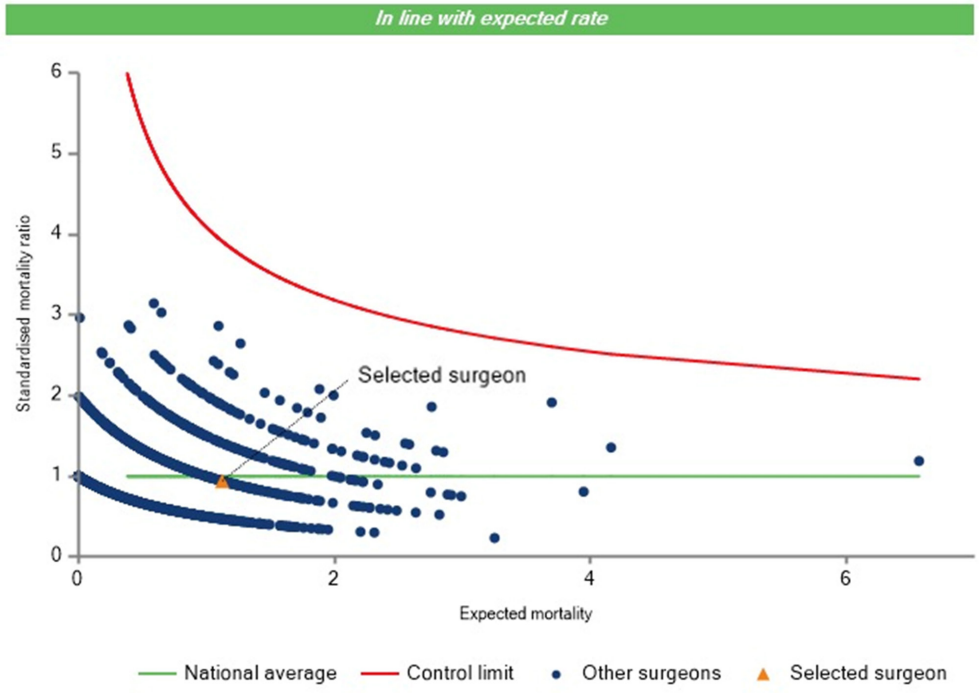
However, to be able to identify whether performance is as expected or not and ensure the statistical analysis is valid, there needs to be enough volumes of cases for an appropriately 'powered' dataset[11].

The power of any dataset is dependent on a variety of factors, principally the size of the sample and the rarity of the event. This presents a problem for the production of comparative information as an individual hospital or consultant may not perform enough procedures for an analysis to confidently state whether they are performing 'as expected'.

Example from the National Joint Registry

This can be illustrated using a 'funnel plot' from the National Joint Registry, which shows the 90-day mortality rates for consultants during the period August 2016-August 2021 (Figure 1). It also takes into account case-mix, which is discussed further under Issue 7.

Figure 1: Funnel plot from the National Joint Registry



Surgeons who appear below the red line have a mortality rate within expected statistical limits. The further to the right a surgeon appears, the more (and the more complex) cases they have performed. Although there are several consultants who have above average mortality rates, the overall rate is still 'as expected' and these consultants fall between the green line and the red line. Consultants to the left of the red line have activity levels which are too small to be able to determine whether not their mortality rates are as expected.

11 https://www.statisticsdonewrong.com/power.html

Although there is apparent variation among the consultants, all appear within the 'as expected' or 'can't say' zones, and it is not possible to determine whether one consultant is superior to another.[12]

If a consultant was outside the expected range (above the red line) they would be an 'outlier'. This would require further investigation to determine whether the cause is the consultant's clinical practice or factors beyond their control (Issue 7).

However, the absence of events does not necessarily mean that one hospital or consultant is safer than others, especially when it comes to rare events, as the chances of that event occurring are extremely low, and avoidance may be more a result of good luck than good clinical judgement (Walker et al.)[13].

During the Assessment Project, PHIN data was tested to determine whether it had the statistical power to be able to confidently identify outliers.

The results demonstrated that it was not possible to identify outliers at consultant level for adverse events or outcomes (PROMS) because the size of the dataset and the rarity of the events did not provide sufficient statistical power.

It was possible to identify outliers in the non-case-mix-adjusted data at site level for some measures. However, it appeared that the variation could be explained by differences in case-mix rather than 'true' differences in performance.

The reasons for the lack of power in the data were:

- The rarity of adverse events, making it harder to determine whether a particular event happened by chance.
- The relatively small number of procedures performed by each consultant (and to a lesser extent site).
- Data quality issues, in particular missing data. For example, PROMs data is available for less than 5% of some of the required PROMs procedures. If case-mix factors are only available for some patients this further reduces sample size when making comparisons (Issue 8).
- Lack of data over a long enough time-period to be able to spot whether a potential outlier is a one-off chance event or a true anomaly.
- Narrow definitions of current procedure groups, which limit the sample sizes (Issue 9).

These issues are compounded by the fact that PHIN data only contains privately-funded care. This means that even if a site is confidently identified as being the worst performer for a particular privately-funded procedure, it could still perform better than most or all providers when NHS-funded procedures are taken into account. Information on NHS care would be needed to make properly valid comparisons but this is outside the scope of the Order (Issue 2).

However, it was recognised that PHIN data is powerful enough for the publication of national-level overviews in the public domain. These overviews could help inform consumer choice by providing insight into the volumes and outcomes of procedures. This information could help patients understand what to expect from an operation and inform conversations with consultants, hospitals and insurers. Publication at this level would overcome many of the statistical and clinical barriers encountered in the publication of more granular data.

For example, PROMs data published at regional or national level could provide valuable context and insight into what a patient might reasonably expect to gain from treatment. Aggregated data would also enable the publication of more detailed outcomes information about the procedure itself.

Similarly, average length of stay for a procedure could be published at national level segmented by age band or sex. This could help inform patient choice and shared decision making between clinicians and patients on management options.

To avoid small number rules, procedures in scope for this national view would need to be performed in sufficient volumes. There would be some variation for each measure, but it is expected minimum reporting would include total volume, length of stay and demographic data to allow segmentation and enable patients to select a sub-group that represents 'patients like them'.

12 In more technical terms, the diagram shows that there is variation in the data, but the null hypothesis that all surgeons perform to similar standards cannot be rejected as all of them appear below the control limit.

13 https://doi.org/10.1016/s0140-6736(13)61491-9

3.2.6 (a) Recommendation 6: PHIN should publish information relating to all measures and procedures aggregated at a national level, with general breakdowns by broad patient characteristics. This will help to address the AEC by providing additional context for patients/consumers making healthcare choices.

PHIN should publish information on high volume procedures at national level. This should include segmentation by different patient attributes such as age, sex and diagnosis to enable patients and consumers to gain insight into what to expect for each procedure (Also Recommendation 7).

3.2.7 Issue 7: Differences in the characteristics of the patients treated by different hospitals and consultants are likely to account for a large proportion of variation in measured patient outcomes. Without adjusting for these differences, publication of comparative information may be misleading. However, the ability to perform case-mix adjustment is dependent on clinically validated models, which are absent for all the Article 21 measures. There was extensive discussion on the need for case-mix adjustment, in order to account for patient risk factors and comorbidities that may influence outcomes independently of operator technique or operator setting. It was agreed that identifying, adapting or devising novel case-mix models would not be feasible.

Case-mix is a way of grouping together cohorts of patients who share certain defined characteristics for the purposes of statistical analysis and to help understand the factors that may cause variation seen in the data. Age and gender are essential case-mix factors and provide a useful starting point to case-mix adjustment and are reliably recorded by healthcare providers. Other commonly used case-mix factors include type of procedure, number and type of comorbidities, ASA score, socioeconomic status and ethnicity[14].

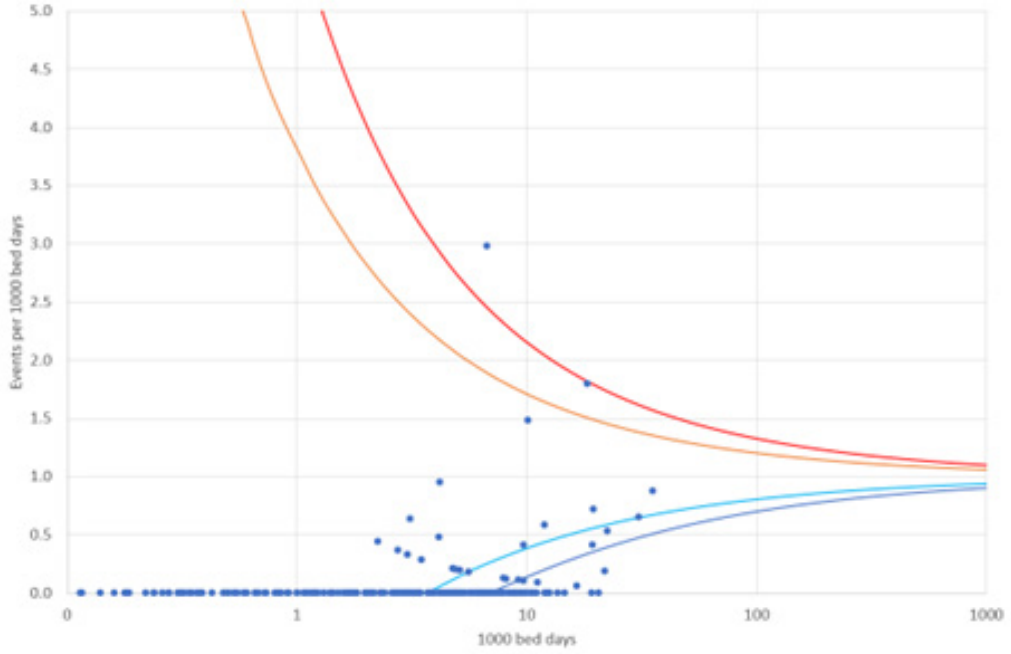
Case-mix can be used in two ways: to segment information by a particular variable such as age bands and to adjust for a particular variable such as deprivation. The feasibility of applying each of these to the PHIN data was explored in several ways.

PHIN data was analysed to assess the impact of case-mix on several of the measures to ascertain if it would be possible for adjustments based on case-mix variables.

Impact Assessment: HRAE data

Hospital Reported Adverse Events (HRAE) data was tested to see if any statistically significant differences could be discerned between hospital sites' self-reported mortality and infection (HCAI) rates. The exercise used a Poisson test to determine p values for each site's event rates per 1,000 discharges (for mortality) and bed-days (for infections). Figure 2 shows self-reported HCAIs and illustrates how the majority of hospitals fall within two standard deviations of expected performance: one hospital was between 2 and 3 standard deviations above, and one was 3 standard deviations above. These are industry standard thresholds and are typically referred to as 'alert' and 'alarm', respectively. Similarly, those within the +/-2 standard deviation range could be said to be performing 'as expected'. Based on the data PHIN collects for this measure, we can discern no statistically significant difference in performance for the overwhelming majority of hospitals in the cohort.

Figure 2: Funnel plot of crude HCAI rates by hospital (excludes hospitals with no data or suppressed counts)



14 https://bit.ly/PubMedDAPROC

However, two hospitals were flagged as 'alert' and 'alarm'. On further investigation, it became apparent that these hospitals had used a different definition of 'HCAI' which included community-acquired infections and are therefore outside the hospital's control. Without this context, publication of data showing outliers could be misleading.

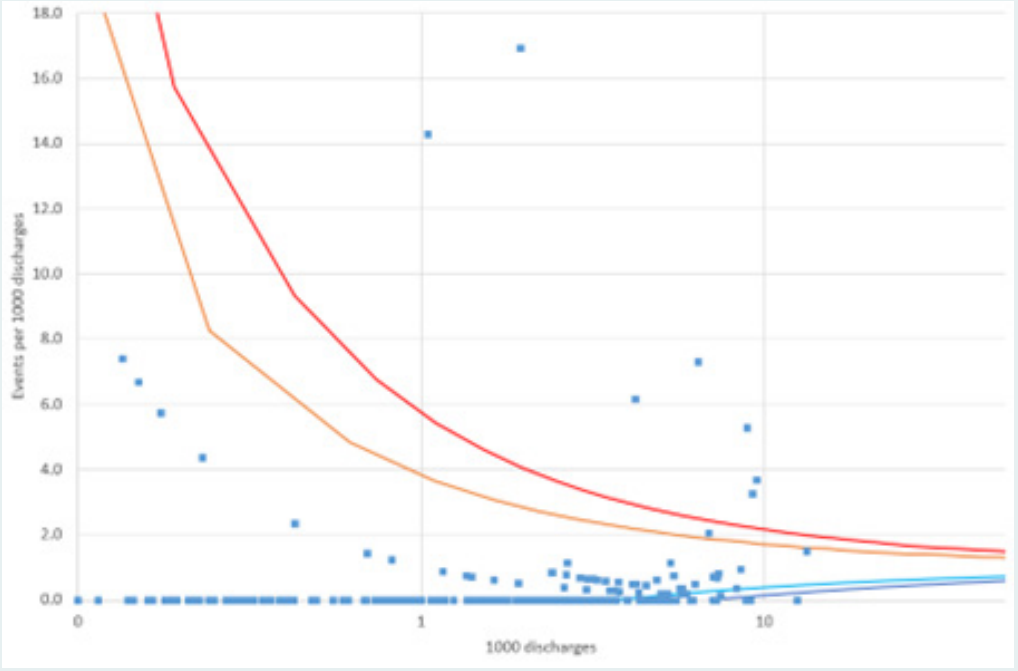
However, publication of these results on PHIN's Portal should lead to further investigation by the hospitals concerned to determine whether the statistical analysis indicates genuine clinical issues for the negative outliers or whether this is due to other factors outside their control. Similarly, positive outliers could be the result of the sites not testing comprehensively for infections and highlighting this should also help to inform clinical practice.

PHIN intends to resolve these issues by providing more context to the current HCAI publication, and by working with providers to both clarify the definitions and to publish separate rates for hospital- and community-acquired infections.

Impact Assessment: self-reported mortality

When looking at self-reported mortality (Figure 3), seven hospitals fell outside of the upper control limits. However, all these hospitals provide some form of either specialist or palliative care for cancer patients, who accounted for the majority of deaths. When these cases are excluded, as they are in most models measuring mortality, these hospitals no-longer appear as outliers.

Figure 3: Funnel plot of crude mortality rates by hospital (excludes hospitals with no data or suppressed counts)



The above examples highlight how definitions and case-mix can produce potentially misleading negative outcomes. However, the same applies to 'positive' indicators of care, such as PROMs, where the degree of patient improvement is dependent on their starting-state.

Case-mix adjustment is dependent on two factors: The availability of appropriate models and the availability of consistently recorded data to be able to support those models.

To identify appropriate case-mix models for the Article 21 measures, the Assessment Project looked at existing NHS precedent and the research literature. It found there were no case-mix models which could be used across the breadth of the measures in the Order. Simple models (based on age and sex) were commonly used, but these would require testing on the PHIN data and external validation to make sure they were appropriate.

Where measure-specific case-mix models do exist, they are context-dependent and rely on specialty or procedure-specific variables, which are not currently available to PHIN.

Models have been developed and validated in datasets from other countries and for an NHS population, but these have not been validated for a population undergoing privately funded care.

Where case-mix models do not exist, PHIN would need to develop them. This is resource intensive, requires significant data science skills and would deviate from our core aims.

Case-mix adjustment is designed to separate the 'signal from the noise'. In the context of PHIN, this means separating indicators of clinical performance from the many other factors which can contribute to different patient outcomes not all of which are represented in the data. This presents a significant methodological challenge as noted in the research literature.

Considering the ranking of consultants, Gutaker et al.[15] conclude:

> "Consultants vary in terms of their clinical outcomes and resource utilisation, and that in general the proportion of unexplained variation at consultant level exceeds that at hospital level. However, both consultant and hospital factors explain only a small fraction of the variation in risk-adjusted patient outcomes and process measures (length of stay, mortality, and readmissions) compared with unmeasured patient characteristics and random noise... In addition, relatively small patient samples per consultant make it difficult to form reliable judgements about consultants' individual performance, and [we] suggest that producing and publishing such comparisons may be at best uninformative and at worst misleading."

This applies both to peer-to-peer comparisons and comparisons against benchmarks. It should be noted that the above conclusions were drawn from analysis of NHS datasets with a significantly larger sample size than found in the privately funded data available to PHIN. This means that PHIN's data is also likely to be impacted by small sample size and that some results may not be an accurate depiction of performance.

Similarly, Proudlove et al.[16] conclude for NHS Trusts:

> "Our results show that rankings must be treated with great caution, especially in the middle-ranges of 'league tables'. [This presents] more evidence for Goldstein and Spiegelhalter's (1996) view that rank-ordering units may lead to spurious, non-robust results, and for the recommendation from the Royal Statistical Society (Bird et al., 2005) that performance measures should always be reported with consideration of the uncertainty underlying their construction. The use of league tables by organisations to accrue status, or by governments to reward organisations (for example with greater autonomy; Talbot, 2010), should be approached with care and caveats."

Proudlove et al. recognise that models can be developed to identify potential outliers. However, these models take significant effort to develop, require clinical validation and should be used for learning and improvement in the first instance rather than as a ranking tool.

The significant consequences of misrepresenting performance by either not applying case-mix adjustment models or by misapplying models has also been reported (Nashef et al.[17] and Sharma et al.[18]).

Given the above, and the issues described under Issues 6 and 8, NHS organisations (e.g. clinical registries, GIRFT, NCIP) have been cautious about publishing comparative outcomes data in the public domain at hospital and, particularly, consultant level, even though some of these organisations have been collecting richer data sets than PHIN over an extended period of time (Issues 6 and 8).

15 https://doi.org/10.1016/j.healthpol.2018.04.004

16 Nathan C. Proudlove, Mhorag Goff, Kieran Walshe & Ruth Boaden (2019) The signal in the noise: Robust detection of performance "outliers" in health services, Journal of the Operational Research Society,70:7, 1102-1114, DOI: 10.1080/01605682.2018.1487816

17 https://doi.org/10.1016/S0140-6736(17)31609-4

18 Sharma V, Chowdhary S, Abdul F, et al A detailed analysis of patients included in the Summary Hospital-level Mortality Indicator (SHMI) for myocardial infarction (MI) – all is not what it seems? BMJ Open Quality 2020;9:e000836. doi: 10.1136/bmjoq-2019-000836

It remains PHIN's aspiration to perform detailed case-mix adjustment. Currently, however, this is not possible because each measure would require its own model, and each model would require the collection of a significant additional number of descriptive variables (Issue 8).

Despite the difficulties surrounding case-mix adjustment identified during the Assessment Project, the value of being able to show the differences between patients treated by different hospitals and consultants was recognised (case-mix segmentation). In particular, this would enable patients and consumers to see where 'patients like them' were treated and provide a view of potential surgical outcomes.

3.2.7 (a) Recommendation 7: PHIN should not aspire to produce complex case-mix models at present. However, where possible, PHIN should publish more information to show the differences between the patients seen by hospitals and consultants, and to segment the data published to show outcomes for those different patients.

PHIN should not attempt to include complex case-mix adjustment in its reporting at the current time as these are dependent on the existence of validated models and are usually specific to individual procedures.

As an interim step, PHIN should publish information on both the portal domain and public domain in a way that can be segmented by variables, such as age and sex, to show how differences in patient characteristics affect the measures. PHIN should enhance all its publication channels to enable more sophisticated presentation of the data held. This will enable differences in the patients seen by different hospitals and consultants to be made visible and would enable patients to see where 'patients like them' are treated.

3.2.8 Issue 8: PHIN's ability to publish information is dependent on us receiving all the required data, and on it being accurate and complete. There remain significant gaps in reporting to PHIN which need to be addressed.

Throughout the Assessment Project, a recurring theme was the need for high volumes of high-quality data as a key precursor for the future publication pathway and to meet aspirations to include complex case-mix adjustments.

PHIN is dependent on private providers to supply data that is 'detailed and complete' enough to facilitate the production of information on the measures that is both statistically valid and meaningful.

Not all hospitals meet their legal obligations to provide us with the required data. This limits our ability to publish even basic information about procedures.

PHIN has established a process for collecting and validating data from providers, but in some cases, data fields are not being populated sufficiently or at all.

The quality of healthcare data is a common problem, particularly when information is routinely collected for one purpose, which requires a certain level of completeness and accuracy, but then repurposed for another use, which may require higher levels of either or both.

For example, in the mandatory NHS PROMs programme, typically only 40% of the records are coded sufficiently to enable case-mix adjustment[19].

Accurate data on patient diagnosis has presented significant challenges for PHIN. We routinely monitor and compare the quality of the diagnostic clinical information we receive in the form of ICD10 codes[20]. As well as being needed for basic measures reporting, this data is a key ingredient in most clinical case-mix adjustment models. Failure to fully record the comorbid state of a patient will result in erroneous and potentially misleading results.

19 https://bit.ly/PROMsGV12 and https://bit.ly/PROMsMetha

20 ICD10 is the 10th revision of the International Classification of Diseases, a medical classification list by the World Health Organization (WHO). It contains codes for diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases.

Secondary diagnostic codes

Table 5[21] compares the average number of secondary diagnostic codes (codes that record comorbidities relevant to the main condition being treated) present in the data for four common procedures across Private Admitted Patient Care (APC) and the NHS[22]. Both sets of data are based on elective treatments, but the table reveals a consistently higher number of secondary codes for procedures carried out in the NHS. Taken at face value this would either indicate that the NHS treats more complex elective cases or that the private sector is failing to fully record the complexity of its patients. In reality, the disparity is likely to be due to a combination of these factors. The latter, in particular, is a significant barrier to implementing case-mix adjustment models using PHIN data.

Table 5: Comparison of depth of coding between private and NHS elective activity for four common procedures

	Mean (secondary) diagnosis coding depth	
	Private APC	NHS APC
Cataract surgery	1.4	3.6
Diagnostic upper GI endoscopy	1.4	3.2
Hip replacement (primary)	1.9	4.3
Knee replacement (primary)	2.0	4.5

As a secondary analysis, Table 6 compares the coding of the same four procedures between two private providers. Again, one could conclude that either Provider A treats more complex patients, or that Provider B is under-recording comorbidities or 'over coding' its activity).

Table 6: Comparison of depth of coding between two private providers' elective activity for four common procedures

	Mean (secondary) diagnosis coding depth	
	Private Provider A	Private Provider B
Cataract surgery	2.0	1.0
Diagnostic upper GI endoscopy	2.7	0.9
Hip replacement (primary)	2.9	1.5
Knee replacement (primary)	3.4	1.5

Although some hospitals need to improve the quality of the data they send to PHIN, it was also noted that the current data specifications may not capture information in a way that optimally supports measure production, as these specifications were derived from outdated standards that are not fully representative of the complexities of private care provision.

In particular, the current specifications do not support working arrangements where the consultant performing the operation is different from the consultant responsible for patient admission. This can make it appear that some consultants have performed operations they haven't or have not performed operations they have. Greater granularity in some of the specifications would also enable more sophisticated reporting; for example in the case of mortalities, where it is not currently possible for providers to distinguish between expected and unexpected deaths.

21 The data in Table 1 and Table 2 are sourced from PHIN's portal (https://portal.phin.org.uk/Report/ClinicalCodingDepth)
22 This is elective NHS admissions present in the Hospital Episode Statistics (HES) data supplied by NHS Digital.

3.2.8 (a) Recommendation 8: Data quality is the foundation of everything PHIN publishes and we should continue to work closely with hospitals and consultants to improve the quality of inbound data.

PHIN should work with the CMA, hospitals, consultants and other stakeholders to ensure all the required data is submitted. To make this consistent, PHIN should produce clear guidance for the submission of data. PHIN should also review its data specifications to ensure optimal support of measures publications without undue burden on hospitals or consultants.

As outlined in the Plan, key enablers have been developed to address this, notably the Data Quality Improvement and Presumed Publication projects. These will continue as originally proposed to improve the volume and accuracy of incoming data.

3.2.9 Issue 9: PHIN currently defines procedures in a manner that is intended to satisfy the needs of both patients and clinical audiences. However, clinicians find the procedure groups lacking in detail and patients find the current, technical definitions unintelligible and of limited use for navigating the information we publish.

PHIN receives data about procedures from hospitals in the form of internationally standard OPCS codes[23]. These technical codes are used clinically to represent which detailed procedure was performed, often in combinations of OPCS codes and/or ICD-10 codes. However, these are not intended to be used for the direct reporting of outcome measures such as those set out in the Order, nor by patients. Several organisations that use OPCS/ICD codes have attempted to group them into meaningful 'bundles' so that data with those codes can be analysed and presented meaningfully to different audiences. Such groupings are domain-specific and it does not necessarily follow that grouping for one purpose will be suitable for use for another.

For example, the NHS defines 'hip replacement surgery' using a variety of different codes for different purposes:

- For PROMs, to identify eligible procedures for which the outcomes questionnaires are relevant.
- For surgical-site infections reporting.
- For payment purposes via Healthcare Resource Groups (HRGs).

PHIN has attempted to devise its own single 'Procedure Group' list. However, a major problem with this is that it needs to satisfy the requirements of two distinct audiences: clinicians who want fine-grained data to be available to highlight the subtle differences in clinical practice, and patients, who usually require access to more general information. Presenting patients with technical clinical terms is unhelpful. However, clinicians may want to differentiate between these different operations, since they may have intrinsically different risks and outcomes.

The procedure groupings that PHIN currently uses have been defined with the input of clinicians, and generally favour their requirements. The result is that they are quite narrow, as they have been designed to ensure that only very similar procedures are grouped together.

Feedback from the Assessment Project found that, in general, the way we currently define procedures is unhelpful for patients as it is often too granular and technical. For example, a patient considering knee replacement surgery may not understand the distinction between total knee replacement surgery, and semi-knee, or patellofemoral, even though these are clinically distinct procedures and separately reported on by PHIN.

Another disadvantage of using, fine-grained procedure definitions is that activity is divided into many small, specific categories. The result is that each category contains very few procedures, limiting the power of statistical analysis and in turn hampering our ability to publish meaningful information (Issue 6).

23 https://bit.ly/NCCSADQI

3.2.9 (a) Recommendation 9: PHIN should review its procedure definitions, recognising the dual requirements of granularity for clinical interpretation and aggregation for patient understanding and engagement.

PHIN should work with stakeholders and experts to develop a more flexible and tailored approach to procedure groups.

PHIN should review its procedure definitions to include less granular groupings. This may better serve the needs of patients who want to find out which surgeons and sites provide a particular type of procedure rather than where a very specific, clinically defined procedure has been done.

Outcomes should only be reported at this more simplified level where they remain meaningful. PHIN should continue to publish granular procedure groupings in the portal domain for expert users. Additionally, PHIN should work with other agencies and programmes, such as GIRFT and NCIP, to align procedure definitions wherever possible. As described in Issue 3, PHIN should take care not to imply, through its procedure definitions, that it is providing direct clinical advice, for example by avoiding the use of definitions that include symptoms and diagnoses.

3.2.10 Issue 10: Although PHIN is able to publish information relating to a significant majority of admitted care activity in the UK private healthcare market, there remains a significant number of providers who are yet to fully comply with their legal obligations under the Order in terms of data compliance.

The Assessment Project found that a number of sites still provide no information, incomplete or poor-quality information to PHIN (Issue 8). These organisations are in breach of their obligations under the CMA Order and limit our ability to publish information to address the AEC.

More transparency around individual organisations' compliance with these reporting obligations could be useful for consumers as well as driving compliance across the sector.

Participation and data quality metrics provide useful insight into how seriously consultants and hospitals take these obligations. Evidence from studies of chronic conditions and elective surgery suggests participation in healthcare registries has a positive impact on processes and outcomes[24]. Performance feedback reports are generated for physicians and hospitals which can help identify where processes are outside of guidelines or expected variation. This in turn can create a trigger for action by consultants or hospitals.

It is likely that the same principles can be applied to PHIN, making the submission of data likely to be a quality indicator in its own right.

3.2.10 (a) Recommendation 10: There should be an increased focus on publication of information on how far hospitals and consultants comply with their obligations under the Order, This will both increase compliance and provide insight for patients into the efforts consultants and hospitals are making to meet their legal obligations.

PHIN should publish information on the extent to which hospitals and consultants are complying with their legal duties under the CMA Order, including the quality and completeness of data provided.

PHIN should strengthen its public reporting on both provider data participation (including overall compliance, data maturity and data quality) and consultant participation in order to incentivise them to engage and comply.

24 For example, https://bit.ly/ICRQPCCO

4.1 Recommendations for each measure

Tables 6 and 7 set out the recommendations that have been applied to each measure to arrive at the publication targets set out in Tables 1-3 and whether/ how this differs from the aspiration set out in the Plan. Where variations are being recommended, it explains why the research and Assessment Project deemed this necessary.

4.2 At hospital level

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Volume	While the measure published meets the requirements of the Order, PHIN will enhance the information presented to further aid patient comparisons (e.g. by introducing new views of the information, and filtering to enable patients to focus on 'patients like them'), trends and benchmarking. We will work to improve participation and coverage, in particular considering how to capture NHS-funded activity more accurately to show 'whole practice' information for hospitals.	No change from the Plan	N/A
Length of stay	While the measure published meets the requirements of the Order, PHIN will enhance the information presented to further aid patient comparisons (e.g. by introducing new views of the information, and filtering to enable patients to focus on 'patients like them'), trends and benchmarking. We will work to improve participation and coverage, in particular considering how to capture NHS-funded activity more accurately to show 'whole practice' information for consultants and hospitals. Consideration will also be given to how to further develop our length of stay metric to reflect the impact of case-mix and complexity in a more sophisticated way than our current model.	As stated in the Plan but with the following exceptions: a) Any publication incorporating case-mix will initially only be available in the portal domain.	a) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication of simple case-mix adjustment in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Infection rates (SSI)	Publication of SSI for individual procedures as defined by the UKSHA and set out in our current data specifications, including case-mix adjustment if possible.	As stated in the Plan but with the following exceptions: a) Public domain publication will remain limited to SSI rates for hip and knee replacement. b) In the portal domain only, we will publish information on all available UKHSA defined SSI procedures. c) Any publication incorporating simple case-mix will initially only be available in the portal domain.	a) The extended range of procedures in the UKHSA list is not mandatory, meaning levels of reporting vary widely across providers resulting in comparisons which would be unfair and uninformative. b) Encouraging hospitals to report these infections for more procedures provides the opportunity to eventually put these measures into the public domain. c) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Infection rates (HCAI)	Publication of HCAI at hospital level to be enhanced to differentiate between community- and hospital-acquired infections, and other case-mix variables if possible.	As stated in the Plan but with the following exceptions: a) Publication of community versus hospital-acquired infections will initially be in the portal domain only. b) Any publication incorporating case-mix will initially only be in the portal domain.	a) The explicit recording of community versus hospital-acquired routes of infection is insufficiently uniform across hospitals to enable publication in the public domain. In the portal domain, we will enable filtering and analysis of infections data that may help identify the source of the infection. If this proves successful, this data may eventually be published in the public domain. b) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Readmission rates	Publication of self-reported readmissions at site level and per procedure ('as expected' and rates) – enhanced to include case-mix if possible. This will be extended to include readmissions to other hospitals (including to the NHS).	As stated in the Plan but with the following exceptions: a) There will be no enhancements to the current public domain publication, but breakdowns by procedure will be available in the portal domain to provide experimental benchmarking information for use by hospitals and consultants. b) Any publication incorporating case-mix will initially only be in the portal domain. c) Readmissions to hospitals other than the one providing the index treatment will be published in the portal domain, where possible.	a) It is not possible to break down the hospital-level readmission rates by procedure nor to provide expected rates for publication in the public domain due to limitations in the statistical power of the data we receive. b) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement. c) The addition of readmissions linked to NHS hospitals and other private sites relies on patient-to-patient record linkage and on being able to accurately follow patients' journeys across multiple providers (private, NHS and international). Currently, this is not possible due to limitations in the data and prevailing information governance rules. We will investigate the feasibility of publication in the portal domain to assess whether publication in the public domain is possible at a later date beyond the current plan.

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Revision surgery rates	Further work will be completed by the Task and Finish Groups and PHIN will work with the CMA to finalise a policy position on this in 2022.	It has been agreed that this is out of scope.	N/A
Mortality rates	Publication of mortalities per procedure ('as expected' and rates) – enhanced to differentiate between anticipated (e.g. palliative care) and unanticipated deaths, and other case-mix variables if possible. Inclusion of 'all-cause mortality' rates, via linkage to ONS mortality data.	As stated in the Plan but with the following exceptions: a) Breakdowns by procedure will be available in the portal domain and will provide experimental benchmarking information for use by hospitals and consultants. b) Any publication incorporating case-mix will initially only be in the portal domain. c) All-cause mortality (i.e. reporting of all deaths regardless of cause within a defined time after discharge) will be initially published in the portal domain where possible.	a) It is not possible to break down the hospital-level mortality rates by procedure. b) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement. c) Publication of all-cause mortality requires linking private care records to externally provided mortality data. It is not possible to produce information of sufficient quality for publication in the public domain due to limitations in the data, prevailing information governance rules and the need to include international patients.

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Unplanned transfers	Publication of unplanned transfer rates at overall hospital level to be enhanced to differentiate between those attributable to clinical vs. financial causes. Case-mix adjustment if relevant and possible. As unplanned transfers largely relate to processes at a hospital level rather than a procedure-level, this may not be publicly reported at procedure level. However, we will additionally explore whether there are particular risks related to specific procedures.	As stated in the Plan but with the following exceptions: a) We will not differentiate between clinical and financial causes. b) Any publication incorporating case-mix will initially only be in the portal domain.	a) Discussions indicated that capturing the different reasons for unplanned transfers would be too difficult in the absence of a standardised approach across the sector. Therefore, it would not be viable to present this information at a more granular level than already published. b) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.
Patient feedback	PHIN and its members will look to introduce comments and testimonials in a later phase of the Plan.	No change from the Plan.	N/A
Links to registries	PHIN remains committed to exploring further opportunities to co-operate with additional registries, and to explore self-reporting of participation in registries.	No change from the Plan.	N/A

Measure (hospital-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Patient-reported outcomes (PROMs)	PROMs reported for a minimum of six measures with overall completion rates from eligible hospitals and minimum of national-level view of pre- & post-treatment outcomes published for each measure.	No change from Plan.	N/A
Adverse events	Publication of 'never event' numbers at hospital level. These reflect system-wide safety issues and as such publication at procedure level is not appropriate. Publication of rates and case-mix adjustment are not appropriate, according to NHS standards. Publication of 'serious injury' numbers and rates. This will be enhanced to include more comprehensive information about different types of events. For 'returns to theatre', publication of rates at site and procedure level ('as expected' and rates), including case-mix adjustment where possible	As stated in the Plan with the exception that: a) For 'serious injuries', there will be no further breakdown by type or severity of event. b) For 'returns to theatre', there will be no further breakdown of hospital-level data by individual procedures. c) Any publication incorporating case-mix will initially only be in the portal domain.	a) The further breakdown of 'serious injuries' remains an aspiration but is on hold while the implications of changes in the national reporting framework for these events are being finalised. b) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.

4.3 At consultant level

Measure (consultant-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Volume	While the measure published meets the requirements of the Order, PHIN will enhance the information presented to further aid patient comparisons (e.g. by introducing new views of the information, and filtering to enable patients to focus on 'patients like them), trends and benchmarking. We will work to improve participation and coverage, in particular considering how to capture NHS-funded activity more accurately to show 'whole practice' information for consultants.	No change from the Plan.	N/A
Length of stay	While the measure published meets the requirements of the Order, PHIN will enhance the information presented to further aid patient comparisons (e.g. by introducing new views of the information, and filtering to enable patients to focus on 'patients like them'), trends and benchmarking. We will work to improve participation and coverage, in particular considering how to capture NHS-funded activity more accurately to show 'whole practice' information for consultants and hospitals. Consideration will also be given to how to further develop our length of stay metric to reflect the impact of case-mix and complexity in a more sophisticated way than our current model.	As stated in the Plan but with the following exceptions: a) Any publication incorporating case-mix will initially only be in the portal domain.	a) Publication of information in the public domain that incorporates clinical case-mix complexity is not currently possible due to the lack of available case-mix models and under-reporting of case-mix variables, such as comorbidities and ethnicity. However, publication in the portal domain will help drive up the quality and completeness of the required diagnostic information and can be used by hospitals and consultants for quality improvement.

Measure (consultant-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Infection rates (SSI)	Publication of SSI for individual procedures as defined by the NHS and set out in our current data specifications, including case-mix adjustment if possible.	SSI rates at consultant level will only be published in the portal domain.	Research, consultation and examination of the data we hold have shown that due to the rarity of surgical site infections, the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.
Infection rates (HCAI)	No direct publication of HCAI, as these relate to processes at a hospital site, but we will show information about the hospitals at which the specific consultant works.	No change from the Plan.	N/A
Readmission rates	Publication of 'readmissions per procedure' ('as expected' and rates) – enhanced to include case-mix if possible. This will be extended to include readmissions to other hospitals (including to the NHS).	Readmission rates at consultant level will only be published in the portal domain.	Consultants should have access to readmission rates attributed to their patients and have the opportunity to audit and review these cases. Research, consultation and examination of the data we hold have shown that due to the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.
Revision surgery rates	Further work will be completed by the Task and Finish Groups and PHIN will work with the CMA to finalise a policy position on this in 2022.	It has been agreed that this is out of scope.	N/A

Measure (consultant-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Mortality rates	Publication of mortalities per procedure ('as expected' and rates) – enhanced to differentiate between anticipated (e.g. palliative care) and unanticipated deaths, and other case-mix variables if possible. Inclusion of 'all-cause mortality' rates, via linkage to ONS mortality data.	Mortality rates at consultant level will only be published in the portal domain.	Consultants should have access to mortality information attributed to their patients and have the opportunity to audit and review these cases. Research, consultation and examination of the data we hold have shown that due to the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.
Unplanned transfers	As 'unplanned transfers' relate to processes at a hospital level rather than at consultant level, this may not be publicly reported at procedure level. However, the relevance (or not) of reporting at consultant level is yet to be discussed in detail, so may be included.	'Unplanned transfer' rates at consultant level will only be published in the portal domain.	The research and consultation have confirmed that 'unplanned transfers' are overwhelmingly a reflection of hospital-wide processes and so publication at consultant level is not appropriate. However, consultants should have access to information about 'unplanned transfers' attributed to their patients and have the opportunity to audit and review these cases. Research, consultation and examination of the data we hold have shown that due to the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.
Patient feedback	PHIN and its members will look to introduce comments and testimonials in a later phase of the Plan.	No change from the Plan.	N/A

Measure (consultant-level)	Aspiration stated in the Plan	Revised publication goal	Rationale
Links to registries	PHIN remains committed to exploring further opportunities to co-operate with additional registries, and to explore self-reporting of participation in registries.	No change from the Plan.	N/A
Patient-reported outcomes (PROMs)	Further work is needed to determine the feasibility of publication at consultant level.	Publication in the portal domain only	Consultants should have access to PROMs information attributed to their patients and have the opportunity to audit and review these cases. Research, consultation and examination of the data we hold have shown that due to the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.
Adverse events	As 'never events' and 'serious injuries' reflect system-wide safety issues publication at consultant level is not appropriate. However, information will be presented about the sites at which a specific consultant works. For 'returns to theatre', publication of rates at procedure level ('as expected' and rates), including case-mix adjustment where possible.	Publication in the portal domain only	Consultants should have access to information about adverse events attributed to their patients and have the opportunity to audit and review these cases. Research, consultation and examination of the data we hold have shown that due to the lack of case-mix adjustment models and limitations in the data we receive, it is not possible to identify statistically and clinically meaningful variations in practice between consultants that are suitable for publication in the public domain.

The members of the Task & Finish groups involved in developing the approach:

- Adrian Roberts – Spire Healthcare
- Nigel Mercer – Consultant Plastic Surgeon and PHIN Non-Executive Director
- Viv Heckford – Ramsay Health Care
- Ben Kelly – Nuffield Health
- Graham Kendall – Independent Healthcare Providers Network
- Kate Oakland – HCA
- Cliff Bucknall – HCA
- Peter James – Circle Health Group

Jon Fistein, PHIN's Chief Medical Officer for leading the drafting process with support from the PHIN team and external reviewers Professor Eva Morris from Oxford University and Maria Davies, medical editor.

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