SUPPORTING DATA QUALITY
NJR STRATEGY 2014/16
Introduction

Improving data quality is one of three key strategic themes for the National Joint Registry (NJR) and, publishing a supporting data quality strategy is one goal outlined in the NJR Strategic Plan.¹

At eleven years since its inception, and with more than 1.85 million records on the NJR database, the registry is a uniquely powerful resource. Not only to monitor the performance of implants, hospitals and surgical technique but to also drive quality improvement in the orthopaedic sector as a whole.

As such a rich resource for the orthopaedic community, its work to improve information availability and accessibility continues apace. However, as a maturing dataset, the NJR’s remit has naturally broadened and the ability for the dataset to drive forward change in other areas has grown – from PROMs to implant price benchmarking, from research to service re-design.

Importantly, a key area has been the roll out of the Government’s openness and transparency initiatives for healthcare. For joint replacement surgery in particular, this has centered on the requirement to deliver more detailed hospital-level and surgeon-level information and outcomes into the public domain. The NJR is the appointed national audit for these initiatives, working in partnership with specialist orthopaedic bodies and societies.

In delivering these programmes, the NJR has been acutely aware of the need to ensure the robustness of the data and understand better, with healthcare providers, areas where data completeness and accuracy needs to be improved. Publishing data at a more granular level requires the NJR and its stakeholders to have a greater degree of confidence in the data and its quality.

The NJR is committed to meeting this challenge and therefore, the breadth of the NJR’s approach to ensuring data quality now needs to expand to meet the requirements of data publication at all levels. This includes the registry’s approach to assessing and processing the data as well as supporting hospitals and surgeons in adhering to best practice requirements in submitting, accessing and validating data in the NJR.

Other changes in the sector also support this focus. The recent cultural and organisational shift in the provision of healthcare has put firmly into focus the need to deliver safe, successful medical and surgical outcomes while realising benefits from cost-efficiencies and developing a sustainable model of care.

In the most recent financial year, 2013/14, data submitted to the NJR has been part of the National Tariff requirement for a new best practice payment for hip and knee replacement surgery. The tariff payments, based on submission of and quality of data submitted to the NJR represent one such financial benefit to NHS providers. Therefore, being able to access a full and accurate picture of their practice in this area is of growing importance.

Following on from these developments, the NJR is determined to enhance its value, by providing reliable and quality data to inform national and local decision making. The registry is committed to doing this in partnership with healthcare providers and all those who need to make use of the data.

¹ NJR Strategic Plan 13/16 and 15/18. Ref 4.1
Aim

In line with the NJR’s Strategic Plan, the overall aim of this data quality strategy is to ensure that the quality, timeliness and completeness of the data submitted to the NJR can support the needs of stakeholders and is in line with its mandatory status.

The strategy document itself also seeks to provide a comprehensive and transparent view of how the NJR works with hospitals to monitor data quality and ensure appropriate data validation.

The specific goals of the strategy are to implement and develop initiatives to:

1. Support quality hospital data collection, entry and submission
2. Monitor data accuracy and data completeness
3. Facilitate validation through routine NJR reporting
4. Work collaboratively to promote the benefits of data validation
5. Provide appropriate external review to ensure compliance

These five areas comprehensively cover the Strategic Plan work programmes, references 4.1 to 4.5.

Governance

The NJR Data Quality Sub-committee is responsible for overseeing the data quality strategy and associated action plans. It was convened in 2014 following external workshops and consultation to discuss and debate the quality of data held on the registry, how it is used and current methods to ensure completeness and accuracy. From these events, it became clear that the NJR would benefit from a dedicated group charged with overseeing existing and new data quality work streams.

The NJR Data Quality Sub-committee will report progress to the NJR Steering Committee.

Overview: NJR-healthcare provider responsibilities

Prior to 2011, the NJR and healthcare provider relationship was one of mutual benefit. The NJR has provided, since its start in 2003, guidance and assistance to hospitals in developing NJR data collection and submission processes. In return, the registry has developed services to feed back information and analysis on the performance of joint replacement surgery and devices; examples include NJR ReportsOnline, NJRStatsOnline and the NJR Annual Report.

Many hospitals have and continue to work hard in implementing an NJR process to ensure that all eligible primary and revision joint replacement operations are recorded on the database and put forward for analysis. In 2003, a team of NJR Regional Coordinators (RCs) was established to drive up best practice and continue to be available on a full-time basis to help trouble-shoot and advise hospitals. This is in addition to regional orthopaedic surgeons who are members of the NJR Regional Clinical Coordinator Network.

In 2011, the registry acquired mandatory status as a national audit. While the benefits of submission to the NJR were already widely known, this mandatory status fully established the registry’s role in helping providers and healthcare teams monitor patient outcomes and focus on patient safety.

Any provider carrying out hip, knee, ankle, elbow or shoulder surgery is now mandated to submit 100% of eligible primary and revision procedures to the NJR.

In return, the NJR continues to develop its feedback services to help hospitals and surgeons monitor their orthopaedic practice. Newer services, such as NJR Management Feedback and the Annual Clinical Report, are under constant review and develop on an annual basis.

The NJR is mandated in:

- **England**, through the NHS Standard Contract as part of the National Clinical Audit and Patient Outcomes Programme (managed by the Healthcare Quality Improvement Partnership)
- **Wales**, through a Memorandum of Understanding with the Welsh Government
- **Northern Ireland**, through a Memorandum of Understanding with the Northern Ireland Department of Health, Social Services and Public Safety
- **The independent sector**, who since 2003 have aimed to comply fully with the registry

www.njrcentre.org.uk
Understanding current data quality

The NJR measures data quality through a number of means, offering a view of case ascertainment at a national and organisation level (compliance) as well as monitoring for the number of records with patient consent (consent) and a valid NHS number on submission (linkability). Please see appendix 1 for the most recently published statistics in relation to these key performance indicators.

Despite much higher compliance in recent years (for example, 77% of NHS Trusts submitting more than 95% of eligible data in 2013), the NJR is still working to ensure its mandatory status. Through ongoing local feedback, the registry knows that some units continue to struggle with systemic process and resource problems, whilst others have not benefited from clinical leadership on use of national audit and quality improvement techniques.

The NJR accepts that these current measurements of compliance can only offer best estimations rather than an absolute measure of case ascertainment. The registry is keen to expand the ways in which it works with providers to assess data quality and improve local submission. Importantly, future work will concentrate on initiatives to understand and identify data that hasn’t been submitted and that will need to be input into the database – it is essential that all primary and revision procedures are recorded.

This is particularly crucial to the NJR’s role in protecting patient safety and monitoring implant performance. Patient consent and a valid NHS number allows the NJR to link a patient’s primary and revision operation together, giving a picture of implant survivorship by implant type and brand for example. Without all eligible data though, especially revision cases, the NJR may not be able to provide a clear picture of performance and this is especially important where poor performance is concerned.

Being aware of this issue, the NJR has sought to start work in this area. A project in 2012 looked at 3,500 revision operations carried out 2003-2009 that had been recorded on the Hospital Episodes Statistics England (HES) database and Patient Episodes Database Wales (PEDW) but not recorded on the NJR. The registry wanted to understand whether these cases were in fact revisions and therefore, eligible for submission. The results showed that at least 78.5% could be confirmed as revisions and the surgeons were contacted following the end of the project to request that these cases be submitted.

Other independent national and local programmes of work have also reflected this, with some performance being shown as much poorer in individual organisations.

What’s clear is that further work now needs to be done to gain a much clearer picture of data quality. Plus, develop more advanced and responsive metrics in order to benchmark data submission, completeness and accuracy.

Challenges

In implementing the data quality strategy, the NJR will need to continue to work with providers to overcome known barriers including:

- Existence of formal NJR data collection and submission procedures
- Available resource(s) and support to maintain best practice
- Communication and understanding of audit and quality improvement in clinical practice

Other considerations include:

- The availability of and accuracy of secondary datasets that can be used for validation (HES/PDEW)
**Data quality: 2014/16 planned work**

Implementation of the data quality strategy spans five work areas. Their reference ID relates directly to the work programmes identified in the NJR Strategic Plan.

Support quality hospital data collection, entry and submission

Through evaluation of current practice, the registry will work to further establish the status and quality of primary data entry at unit level.

This will specifically look at the identification of missing data, data accuracy (errors including coding) and local processes through a national programme of local audit activity.

A separate piece of work will also be carried out, using the NJR system as the start point to identify how to maximise its ability to ensure data submission, collection and accuracy. The NJR database contains a number of business rules to ensure that record duplication does not occur and that data entries must fall between acceptable ranges for example, the height and weight of a patient.

These ‘logical business rules’ are an opportunity to help local units meet the mandatory and best practice requirements of submission to the NJR. Where records do not meet business rules, they are sent to an ‘edit stack’ facility where incomplete records are held until they meet the rules for submission. Management of these records too is also a focus to ensure that undue delays in submission do not occur.

The work of the NJR Regional Coordinators and Regional Clinical Coordinators (RCCS) will continue, providing training, spot checks and guidance to those hospitals needing further support. Based on the RCC model, the intention is also to grow a wider support network for those clinical leads who take on responsibility for data in the NJR and its validation to ensure that data quality responsibilities are clear to all those involved locally.

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<tr>
<th>I.D Strategic Plan ref. 4.2</th>
<th>Work programme</th>
<th>Activity 2013/14</th>
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<tr>
<td>4.2.1 Local primary audit of data input to the NJR</td>
<td>Conduct a pilot across seven hospitals to develop local audit information packs and a toolkit, including action planning, to enable local data validation and improvement</td>
<td>Roll out a national programme of local primary data audits. Through implementation of the pilot, develop a support network for lead data validation clinicians and contacts. Monitor and collate the results nationally to establish central intelligence on unit-specific and wider data quality issues</td>
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<td>4.2.2 Assessment and development of the NJR database ‘logical business rules’</td>
<td>Ensure that mandatory data fields are generating prompt and timely warning messages to units where data has been entered incorrectly</td>
<td>Use the outcomes of the local primary audit pilot (4.2.1) to evolve, as appropriate, the current set of NJR ‘logical business rules.’ This will include advice from the NJR statistical analysis and reporting team</td>
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<td>4.2.3 Development of protocols to manage the NJR system ‘edit stack’</td>
<td>Examine current practice in management of records that are rejected by the NJR database, for example, due to incomplete fields (and forms)</td>
<td>Develop ‘edit stack’ protocol, to enable escalation of submission problems and recommend timescales for submission of incomplete records</td>
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Monitor data accuracy and data completeness

The NJR will improve the use of secondary sources to validate data, following its submission to the NJR. Further use of the HES and PEDW datasets will be made as well as exploring the potential for use of private-sector data flows in benchmarking data quality in the independent sector. The NJR will continue to monitor and report on current data quality metrics during this time (see appendix 1).

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<td>4.3.1</td>
<td>Enhanced validation activity for data in the NJR using secondary datasets</td>
<td>Using HES and PEDW, develop a process and validation report for seven pilot units. Work with relevant data controllers, to ensure the flow of data to enable validation activity and escalate where necessary.</td>
<td>Develop a dashboard display for units using the outcomes and learning from primary and secondary data validation to enhance Annual Clinical Reporting and hospital profiles at <a href="http://www.njrseohospitalprofile.org.uk">www.njrseohospitalprofile.org.uk</a></td>
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Facilitate validation through routine NJR reporting

The NJR will continue to enable individual and organisation validation of data through its publication of data and development of feedback services. This includes public facing data for example, NJR Surgeon and Hospital Profile, and bespoke applications such as NJR Clinician Feedback, Consultant surgeons’ individual-level reports, NJR Management Feedback and organisational Annual Clinical Reports. The work of the NJR’s Implant Performance and Surgeon Outlier Sub-committees is also included here.

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<td>4.4.1</td>
<td>Enhance validation through routine NJR reporting</td>
<td>Continue to promote and improve communication for NJR data services, raising the profile of these services to individuals and units.</td>
<td>Actively request feedback from stakeholders so that data quality issue can be identified and resolved</td>
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<td>4.4.2</td>
<td>Undertake additional assessments as required to ensure statistical validity of NJR analysis</td>
<td>This activity is a continual part of the NJR process in evaluating data prior to analysis and presenting data through NJR reporting</td>
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Work collaboratively to promote the benefits of data validation

In order to build on relationships developed in agreeing this strategy, the NJR will continue to identify opportunities to work with external national bodies and initiatives, where appropriate, to promote the benefits of data validation.

This may include specific projects to enable NJR data validation through orthopaedic registrar and specialty trainee programmes or those relating to revalidation and appraisal.

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<td>4.5.1</td>
<td>Identify opportunities to promote the benefits of data validation</td>
<td>Establish a dialogue with the British Orthopaedic Network Environment (overseen by the British Orthopaedic Trainee Association) to enable annual NJR audit activity</td>
<td>Carry out pilot work with BONE members to establish appropriate working and reporting arrangements for annual NJR audit activity</td>
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Provide appropriate external review to ensure compliance

The NJR is committed to working in partnership with healthcare providers to ensure data completeness, accuracy and overall quality. The registry recognises that in some cases, this may require the need of additional, targeted NJR support to enable timely, external review of unit-level compliance and data quality.

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<td>4.5.2</td>
<td>Provide a system of external hospital reviews to assess compliance with NJR</td>
<td>To establish an NJR review team, with a range of expertise and agree a protocol for reporting outcomes and agreeing local actions. This includes possible development of a kitemark for compliance with NJR requirements</td>
<td>Identify, following a range of pilot local audit activity, a programme of visits for the NJR external review team</td>
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APPENDIX 1: Data quality – key performance indicators 2013/14

Compliance

National-level compliance rates

The compliance rate measures the number of submissions to the NJR and compares it to the number of levy returns for the numbers of implants sold.\(^2\) It is not possible to establish a direct link between a single levy and the use of the implant and, therefore, this measurement is subject to variations caused by such factors as the procurement cycle, the amount of stock purchased in a single year, and how that stock is used. In some periods, there will be a greater number of procedures reported than levies collected leading to a positive (>100%) compliance rate. Conversely, there will be periods where the number of levy returns is greater than the number of procedures submitted.

Trust/Local Health Board/Independent provider-level compliance

For NHS hospitals in England and Wales, the NJR monitors compliance against data held in the Hospital Episodes Statistics (HES) and the Patient Episode Database Wales (PEDW) services. There are variations between the two comparisons, principally due to coding differences.

Independent sector hospitals do not submit data to either HES or PEDW so it is not currently possible to undertake this comparison for the independent sector.

In the 2013 year:

- 77% of NHS providers reported 95% or more of the joint replacements they undertook
- 16% of NHS providers reported between 80% and 95%
- 7% of NHS providers reported less than 80%

Figure 1.1 Compliance, Consent, and Linkability Rates from 2003 to 2014.

Source: Procedures entered into the NJR 1 April 2003 to 31 March 2014 and levy submissions to the NJR by implant suppliers.

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2 For compliance analysis only, the number of procedures excludes the following procedures: re-operations other than revision; stage one of a two-stage revision; excision arthroplasty; amputation; and conversion to arthrodesis. These are excluded because they do not include the implantation of a component attracting the levy. From Financial Year 2014/15 this will change and the levy will no longer be used to measure compliance.
Patient consent

The patient consent rate compares the number of records submitted where the patient has agreed to their personal data being stored on the NJR database with the number of procedures recorded on the NJR. It is a requirement in England, Wales and Northern Ireland that patients give voluntary consent to have their personal data held on the NJR with their operation data. This personal information is essential to link patients’ primary and revision procedures together in order to monitor the outcomes of joint replacement surgery. Without high rates of consent, the NJR cannot achieve its goals.

Patients rarely decline consent and many units achieve consent rates of 100%. Lower consent rates in other units are generally caused by a lack of robust processes which mean that the completed consent form is not available to the person submitting the procedure details to the NJR.

The overall patient consent rate for records submitted to the NJR in 2013/14 was 91.8%.

Linkability

The linkability rate compares the number of records submitted with the patient’s NHS number with the number of procedures recorded in the NJR. The NHS number is required to link all primary and revision procedures relating to a single patient (NJR data is submitted for NHS number tracing and the ‘linkability’ figure includes NHS numbers that were traced subsequent to the operation details being submitted to the NJR).

The ability to link all operations relating to a single patient is vital in determining clinical outcomes and, without a high NHS number submission rate, the NJR’s ability to monitor clinical and implant performance is adversely affected.

Where the NHS number is missing, tracing is attempted using the NHS Demographics Batch Service. This does, however, require the patient’s name, date of birth and postcode being correctly submitted.

The overall linkability rate for records submitted to the NJR in 2013/14 was 95.1%.

3 Personal data includes NHS number or national patient identifier, surname, date of birth and postcode.
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