



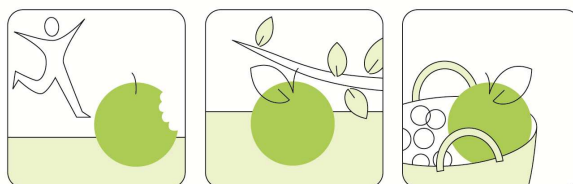
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**Potential Use of Discharge Records in
Outcome Measurement and Link with Data from
Outcome Registers based on the example of
Arthroplasty**

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Introduction

Outcome-oriented, comprehensive data collecting systems via arthroplasty registers have resulted in considerable increase in the quality of medical treatment during the past decades. In Sweden, for instance, the revision rate could be reduced by half since the national register has been launched while in other countries the outcome has remained nearly unchanged within the same period of time.

In almost all countries discharge records are regularly used for evaluations, i.a. also in outcome-relevant issues.

It is the aim of this paper to examine the validity of discharge records outcome-relevant issues and their potential of combined use with register data in evaluations.

Material and Methods

The attempt to directly link data from the Tyrolean Arthroplasty Register with discharge records (MEL Services [MEL=Medizinische Einzelleistungen, i.e. individual medical services as listed in the Austrian Catalogue of Benefits]) could not be realised.

Therefore, the limitations for data fusion and the preconditions for future, successful data evaluation have been compiled in report form.

As an additional point, the reports of the Scottish Arthroplasty Project, at present presumably Europe's most advanced project with respect to outcome measurement based on routinely collected data without being an arthroplasty register in a narrower sense, were compared with those from arthroplasty registers. In this process, data from the Annual Reports as described in WP 5.2.1 were used as reference data.

The Scottish Arthroplasty Project is a project by the NHS in Scotland, a more detailed description is available in the summary of relevant projects in Europe (WP 5.2.1).

Results

Possible Evaluations from Discharge Records for Outcome Measurement:

- An important factor for evaluation options is whether longitudinal analysis is possible or not. Discharge records are usually primarily collected for accounting or other organisational purposes and therefore document a code for inpatient stay as the primary case identification. For the chief purpose of recording services, this is an optimum approach. For outcome measurement, however, personal data linkage and evaluation whether an intervention (e.g. primary operation) has led to a defined secondary event (e.g. revision operation) are essential. At least in Austria, direct linking is currently not feasible for lack of unerring personal identification, as well as for data privacy reasons. The manual assignment of individual cases based on redundantly stored data may be conceivable but is hardly practicable in daily routine.
- The Annual Reports of the Scottish Arthroplasty Project allow for deriving the following possible calculations:
 - Epidemiological calculations such as incidences and probabilities of diagnoses and complications (however, without direct assignment to important variables such as the implant);
 - Market data regarding the range of services in the medical field;
 - Length of inpatient stay; Where the patients were discharged to; Whether the patient made use of aftercare in some institution; Whether the intervention was performed on an outpatient basis or was connected with an inpatient stay;
 - Longitudinal economic data;
 - Waiting list management and other activities important for the public health sector;
 - Revision burden;
 - Descriptive presentation of patient profiles such as age, sex or indications. These data can also be used as adjustment data in comparative analyses. Linking with outcome-relevant endpoints such as revisions is, however, only possible in a very restricted and non case-related way. Mortality analyses would be an example.
- Apart from personal identification, discharge records sometimes fail to provide important data for outcome measurement:
 - The implant, as one of the most essential factors for the outcome;
 - Information about the therapy with respect to both primary operation and revision; to a relevant extent, the documentation of diagnoses in the ICD system does not suffice to clearly discriminate the medical reason of an intervention. Since the DRG system was originally developed for clearing purposes, interventions involving similar expenditure are

occasionally pooled, which leads to a loss in discriminative power.

- Personal identification in a register presupposes unambiguous assignment to the individual person. Therefore, person-specific codings are required that are unequivocal and stable for a lifetime. This is the only way to follow up the frequently occurring changes of hospital between the primary and revision intervention in the dataset.

Discharge records have some undeniable advantages for evaluations:

- They are usually complete.
- They are easy to access.
- They are standardised to a high degree, which is helpful in interdisciplinary evaluations (in an SAP report, for instance, the consideration of anesthesia as an outcome-relevant factor).

For outcome measurement, however, discharge records also have disadvantages:

- The quality of data is often unchecked. A phenomenon observed in large-scale data collections is the inferior quality of data that are not in the focus of the evaluations primarily intended.
- Discharge records are not primarily collected for outcome measurement. Internal data consistency should therefore be checked for each data source before including it in evaluations.
- Outcome analyses incorporate a large number of variables depending on the treatments under examination. Missing data or lack of discriminative power of data thus lead to a considerable reduction in final results, since relevant factors influencing the primary endpoint cannot be checked and adjustments can only be made to a limited extent.
- Data fusion on an individual level is a prerequisite for the stratification of groups in the database and for direct comparisons, thus representing one of the essential requirements for the computation of long-term outcome.
- If the outcome of a primary endpoint is calculable on the basis of discharge records (e.g. mortality, infections, etc.), usually no sufficient data is available with regard to specific therapies or procedures. Therefore, inferential statistics or evaluations are not always possible in the quality required.

Differences as compared to register reports:

- Evaluations in national register reports feature a more comprehensive coverage of all relevant information for patient treatment. This enables the physician –or other persons in charge– to obtain a comprehensive overview of the respective situation by means of a benchmarking system, and make target-oriented decisions which, in turn, can be checked in their impact in the following years.
- Thus, register reports allow for the efficient implementation of continuous quality monitoring and quality improvement projects.
- Discharge records can also contribute to quality improvement, but have other priorities.
 - Indicators and evaluations based on discharge records are rather focused on structure and process quality.
 - Drawing conclusions from structure and process indicators to outcome is possible to a limited extent.
 - For organisational reasons the questionnaires of outcome registers must be concise. One of the main reasons for this is that the work load for the hospital staff caused by documentation constitutes a critical factor for compliance and hence for the completeness of the register dataset. Discharge records contain information potentially offering essential contributions for outcome analyses, for instance:
 - Comorbidities of patients;
 - Services exceeding the primary intervention;
 - Information about the process of medical service (e.g. waits, follow-up, etc.) that might have a relevant influence on the outcome but cannot be included at present for lack of possibilities of overall analysis;
 - Economic data that could be used in cost-efficiency analyses.At present, this is only feasible to some extent even in well developed register systems such as Sweden or Finland.

Prerequisites for the Linking of Discharge Records and Register Data and Potential Added Value for Outcome Measurement:

- The basic data for case identification must be synchronisable. Synchronisation could be performed via a trust centre. Similar aspects have been widely and intensely discussed for years within the scope of the introduction of electronic health records or electronic storage media (e-Card) containing medical basic data. A trust centre has also been planned in Austria for quite some time now, but has not been implemented yet.

- The introduction of a standardised personal identification (european medical code or national equivalents) as reference data in various datasets would make sense with regard to the additional information gained for quality development in health care. However, clarification is needed concerning data protection in data collection, data processing, and the subsequent procedures.
- Outcome data involve a very complex process with many variables and including factors that are changing rapidly. Selective and detailed information is therefore required allowing for target-oriented decisions in support of quality improvement.
- This process, in turn, requires a core dataset in the form of an outcome register modelled on arthroplasty registers.
- A Link with further data from routine data collections such as discharge records will then allow additional applications and adjustments covering the following topics and respective areas:
 - Influence of structural and procedural changes on the outcome;
 - Linking of outcome data and economic data for further and more detailed cost-benefit analyses than common at present.
 - Influence of comorbidities on outcome and proposals for the adaption of interventions based on individual risk profiles.

Summary and Recommendations

- Discharge records alone are not comparable in quality with outcome registers specifically designed for this purpose.
- Target-oriented measures require a great wealth of information and detailed evaluations.
- By focusing on specific, central outcome indicators and longitudinal analyses, outcome registers such as arthroplasty registers offer an adequate basis.
- The inclusion of discharge records and other data regularly collected in the health care system in evaluations of outcome registers allows for essential and additional evaluation options.
- A prerequisite for this, however, is to enable dataset assignment at a personal level, which is currently not possible in all EU member states on the basis of a routine procedure since the basic data for personal identification are not congruent or even not accessible at all.
- In this respect, it is also essential to clarify the regulatory framework (data protection) of such procedures. This could be integrated into current efforts for further data networking in health care, electronic health record, etc.
- The consideration of standardised datasets for personal identification, such as the European Medical Code, might substantially simplify technical solutions.