

# Developing key performance indicators for a lymphoedema service in Ireland using a classic Delphi technique

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## Key words

Classic Delphi technique, key performance indicators, lymphoedema services

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## Abstract

**Introduction:** This is a unique study and a first for lymphoedema services in the Republic of Ireland as relevant national key performance indicators (KPIs) do not exist currently. **Aim:** To identify and develop KPIs for lymphoedema services in Ireland, using a classic Delphi Technique. **Methods:** A two-round classic Delphi technique was used to achieve consensus, initially among an Expert Panel of national and international lymphoedema clinical leads, followed by a panel of multi-disciplinary service referees and experienced clinic lymphoedema therapists. **Results:** After two rounds, a suite of seven KPIs was identified, agreed upon and accepted. The response rate of the expert panel was 93%, with 80% consensus of the multidisciplinary Delphi panelists. **Conclusion:** The suite of seven KPIs developed in this study will play an important role for internal service benchmarking and accountability, and may also contribute to the improvement of public lymphoedema services in Ireland and perhaps other countries around the world with a similar clinical approach to treating lymphoedema.

This study is unique in the Irish context as relevant key performance indicators (KPIs) have not been previously developed or used in lymphoedema services in the Republic of Ireland (henceforth referred to as Ireland). The absence of published KPIs for lymphoedema needed to be addressed to facilitate the audit of a regional hospital-based lymphoedema service in Ireland. This study culminated in the development of a suite of seven KPIs, suitable as a measurement tool for lymphoedema services.

Understanding lymphoedema and its consequences is key to understanding how it can be effectively treated and to the relevance of the proposed KPIs in this study. The Irish Health Service Executive (HSE), which is the governing body of all public health services in Ireland recently published a national report of lymphoedema care in Ireland. A conservative 2.6 per 1,000 suggests an estimated national prevalence figure of approximately 12,380 with an estimated incidence rate of 1,490 newly

diagnosed lymphoedema patients per year as the burden of this condition for health services in Ireland (Health Service Executive, 2018). However, the lack of accurate data collection related to lymphoedema services make it difficult to estimate the true prevalence of the condition in Ireland. Acknowledging the paucity of such relevant data in a previous Irish study, Gethin et al (2012) describe lymphoedema as a “chronic, incurable, debilitating condition, usually affecting a limb and causes discomfort, pain, heaviness, limited motion, unsatisfactory appearance and impacts on quality of life.” The significant impact on quality of life is confirmed by Morgan et al (2005), in a review of the literature evaluating health-related quality of life in lymphoedema (Morgan et al, 2005).

KPIs are relevant as a measurement tool of quality and effective services. Currently, in Ireland there is a lack of such measurement tools, therefore, the development of KPIs is vital for guiding and monitoring the quality of current services on offer to patients. This

suite of seven KPIs also sets the scene for the potential development of a national template of KPIs for lymphoedema services. The Classic Delphi Technique was used for the development of these KPIs, as it is recognised as a favourable and reliable research method for obtaining consensus of a group of specialists regarding a specific area of interest (Hasson et al, 2000). In terms of this study, the agreed consensus overwhelmingly allowed for the development of the suggested KPIs.

## Why key performance indicators are important

KPIs have been adopted extensively by healthcare providers and governments alike as useful vehicles to facilitate the monitoring and evaluation of healthcare quality, especially in relation to service delivery. According to the Health Information and Quality Authority (HIQA), whose mandate is to oversee patient safety in health and social care in Ireland: “KPIs are an essential tool [...] used to identify where performance is good and meeting desired

**Table 1.** List of consulted documents — national and international.

| Document  | Authors/authority     | Jurisdiction     |
|---|-----------------------|------------------|
| Guidance on developing Key Performance Indicators and Minimum Data Sets to Monitor Healthcare and Quality | HIQA                  | Ireland          |
| A Guide to the National Standards for Safer Better Healthcare   | HIQA                  | Ireland          |
| A Practical Guide to Clinical Audit, Health Service Executive   | HSE                   | Ireland          |
| British Lymphology Society (Standards for Practice)   | BLS                   | UK               |
| Best Practice for the Management of Lymphoedema. International Consensus Lymphoedema Framework            | ILF                   | International    |
| Template for Management: developing a lymphoedema service   | Lymphoedema Framework | UK               |
| Key Performance Indicators LNNI. Lymphoedema Network Northern Ireland                                     | LNNI                  | Northern Ireland |

**Table 2.** Delphi phases for this study.

|   |
|---|
| 1. Set of seven key performance indicators (KPIs) developed following literature review and best practice documents |
| 2. Advisory expert panel review proposed suite of KPIs: revisions suggested   |
| 3. Multidisciplinary panel review revised KPIs and give vote of importance  |
| 4. Collation of feedback from panel: > 80% consensus reached on round one, further iteration not required           |
| <b>Suite of seven KPIs generated</b>  |

standards, and where performance requires improvement” (HIQA, 2010). KPIs promote accountability to service users by setting a standard of care and “to central government for the efficient use of resources with other comparable organisations” (HIQA, 2010). Due to the lack of KPIs for lymphoedema services in Ireland, developing them was the first step towards facilitating the monitoring of services and a logical precursor to undertaking an audit.

### Ethics approval

Ethical approval for this study was obtained from both the Research Ethics Committee (REC) at the University Hospital Limerick, Ireland (REC Ref: 006-18; January 1, 2018) and from the Social Research Ethics Committee (SREC) at the University College Cork (SREC Ref: 084; May 29, 2018).

### Methods

Sources consulted in reviewing existing literature included PubMed, CINHAL, SCOPUS, EBSCO, MedLine and EMBASE.

Search terms included “KPI lymphoedema UK” or “Key performance indicators for lymphoedema” or “lymphoedema KPIs” or “lymphedema KPIs Europe” or “key performance indicators for lymphoedema UK” or “key performance indicators for lymphedema USA” or “lymphoedema indicators” and “lymphedema key performance indicators”. LENUS, the Irish Health Repository, was also searched using the above terms and the following: “KPIs for lymphoedema in Ireland”, “Lymphoedema key performance indicators Ireland”. Inclusion criteria was English language only. Grey literature was also searched along with relevant government documents from the Irish Department of Health (Table 1).

The current suite of seven KPIs was generated by consulting healthcare quality and national standards documents, identified evidence-based lymphoedema best practice documents and literature from jurisdictions outside Ireland. Additionally, KPIs from the Lymphoedema Network Northern Ireland (LNNI) were consulted (Table 1).

### Delphi technique and process

The Delphi Technique is described as “a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem” (Linstone and Turoff, 1975). The Delphi Technique is commonly used in health and social sciences research because it is useful where participants do not work together, but who are either experts or practitioners in the field (Holey, 2007). According to Snyder-Halpern (2000), the primary advantages of the Delphi Technique are “its adaptability to diverse data collection strategies, decreased peer pressure; secondary to anonymity and the ease of condensing opinions of many varied experts into a few precise statements”.

Central to the Delphi Technique is the recognition that each participant’s contribution is important to the success of the study, facilitating a convergence of opinions. A systematic series of questionnaires are delivered through repeating iterations that build on the responses of the preceding ones and the process is terminated when consensus is reached (Murphy et al, 2016). This study set 80% as the cut-off point and iterations were undertaken until consensus was reached.

### The expert panel

Cantrill et al (1996) described an expert as “any individual with relevant knowledge and experience of a particular topic”. The expert panel in the Delphi Technique are usually selected because they hold in-depth knowledge on the topic under review. In this study, one national and three international academic and clinical lymphoedema experts were identified. International experts were identified from the UK due to similar service provision. All experts have been professionally involved in the development of healthcare standards of care and/or KPIs. Participation from this group in the study was via email.

### The Delphi stakeholder panel

The Delphi stakeholder panel was selected by purposeful sampling from a multidisciplinary group of relevant stakeholders, in turn screened to exclude anyone with a possible conflict of interest (Figure 1).

The Delphi Technique goes through various phases (Hanafin, 2004), utilising a quantitative approach to data collection and the application of single statistical measures to the identification of consensus. (Hasson, 2000). This study achieved agreed consensus cut-off of >80% with one open expert round and one stakeholder round. The authors, suggest that consensus was reached early because of niche clinical area of lymphoedema services and to the quality of the expert feedback, coupled with the small number of KPIs in the proposed suite (Table 2).

## Data collection and analyses

### Phase one

During this phase, KPIs were developed from the documents outlined in Table 1. Three of the developed KPIs were based on outcome and experience of KPIs trialed by the Lymphoedema Network Northern Ireland, for which permission was generously given.

The consultation process used the Balanced Scorecard™, approach to performance indicators, as prescribed by Kaplan and Norton (1992). Gantly (2010) described these classifications as “inter-dependent as structure can have an impact on processes which, in turn, can have an impact on outcome”.

This scorecard suggests four potential perspectives of performance measurement; those of service user, internal management, continuous clinical service improvement and financial efficiency. All but one (financial efficiency) were included in this process of KPI selection.

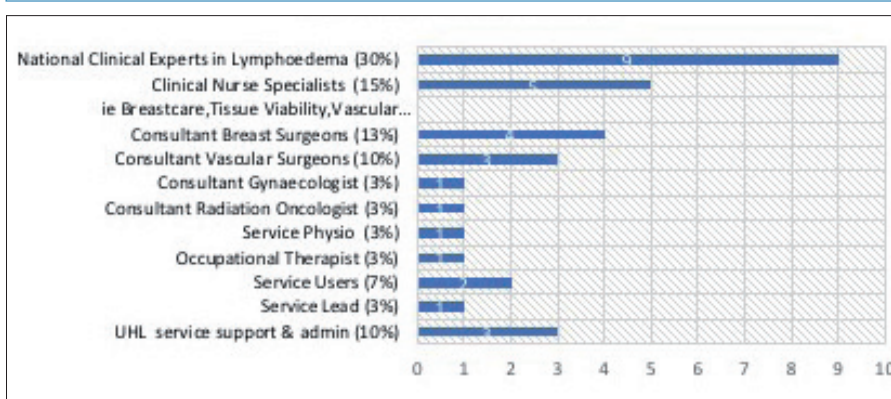
The Donabedian conceptual model that provides a framework for evaluating quality of health care was used to achieve a modified balanced set of KPIs. A four-point Likert Scale was chosen for the rating of importance because it had no neutral point; respondents had to commit to a position as there was no option for neutrality (Brown, 2000; Croasmun and Ostrom, 2011) (Table 3). Panellists were also invited to recommend revisions if required.

### Phase two

An introductory letter defining the purpose of the study was sent to a selected multidisciplinary panel of 30 and they were invited to participate as a Delphi panellist. Written consent was received from each participant.

**Table 3.** Interpretation of the Likert Importance Scale as used in this study.

| Unimportant                              | Slightly important                      | Important                                 | Very important                          |
|--|---|---|---|
| No priority                              | Insignificantly important               | Is relevant to the issue                  | A most relevant point                   |
| No relevance                             | Third-order priority                    | Second-order priority                     | First-order priority                    |
| No measurable effect                     | Has little importance                   | Significant impact, but not high priority | Has direct bearing on major issues      |
| Should be dropped as an item to consider | Not a determining factor to major issue | Does not have to be fully resolved        | Must be resolved, dealt with or treated |



**Figure 1.** Percentage breakdown of Delphi Panellist's relevant to professional background.

### Phase three

The suite of seven KPIs was reviewed by the Delphi panellists following the expert panel feedback and subsequent revision. The predefined 80% agreement as the minimal consensus for KPI acceptance was set. If this was not reached in round one, then a second iteration was planned. Of the 30 panellists invited to participate, 28 responded, giving a response rate of 93.33%.

### Phase four

Given that the agreed KPI cut-off of 80% was reached in round one, a second round was not necessary.

## Data analysis

Data was collated manually and statistically analysed using STATA version 15.1. Standard descriptive statistics were used to summarise the panellists' opinions following their vote of importance. Analysis was based on aggregated scores that were then ranked: 0 = unimportant, 1 = slightly important, 2 = important, 3 = very important (Table 4).

The proportion of the Delphi panellist's

Likert ratings were calculated for each KPI, with a Binomial Exact 95% Confidence Interval (CI) for the combined responses of 'important' and 'very important'. Each KPI required >80% consensus for acceptance, the findings confirmed with 95% confidence that the minimum combined votes of 'important' and 'very important' was >81% for six of the KPIs and was between 77% and 99% for one KPI.

## Results

Consensus in this Delphi study was reached after the first panel iteration, which allowed for the suite of seven KPIs to be accepted (Figure 2). Each of the individual KPIs within the collective satisfied the requirements of a measurable KPI, which was essential to truly represent an accurate picture of performance. The final suite of agreed KPIs was based on the Donabedian 'structure, process, outcome' framework, which is frequently used when assessing health care. It was used to achieve a balanced set of KPIs, which included two structure-related KPIs, three process-related KPIs and two outcome-related KPIs. "Structure criteria refers to what is



**Table 4.** Breakdown of multidisciplinary panel feedback.

| % Response<br>28/30 replied | 0= Unimportant | 1=Slightly<br>Important | 2=<br>Important | 3=Very Important | Combined votes of 2&3<br>(95% CI) | KPI accepted |
|-----------------------------|----------------|-------------------------|-----------------|------------------|-----------------------------------|--------------|
| KPI 1                       | 0              | 0                       | 1 (4%)          | 27 (96%)         | 100% (0.8766–1*)                  | ✓            |
| KPI 2                       | 0              | 0                       | 3 (11%)         | 25 (89%)         | 100% (0.8766–1*)                  | ✓            |
| KPI 3                       | 0              | 1 (4%)                  | 16(57%)         | 11 (39%)         | 96% (0.8165–0.9990)               | ✓            |
| KPI 4                       | 0              | 0                       | 3 (11%)         | 25 (89%)         | 100% (0.8766–1*)                  | ✓            |
| KPI 5                       | 0              | 2(7%)                   | 3 (11%)         | 23 (82%)         | 93% (0.7650–0.9912)               | ✓            |
| KPI 6                       | 1 (4%)         | 0                       | 2 (7%)          | 25 (89%)         | 96% (0.8165–0.9990)               | ✓            |
| KPI 7                       | 0              | 1 (4%)                  | 12(43%)         | 15 (53%)         | 96% (0.8165–0.9990)               | ✓            |

needed, process criteria refer to what is done and outcome criteria refers to what is expected to happen” (HIQA, 2010). Figure 2 outlines the suite of seven KPIs developed.

This is a unique study in the Irish context as, to date, KPIs have not previously been developed or used in Irish Lymphoedema Services. The developed KPIs were centered around equity of access to the service, efficiency of care, evidence of effectiveness of service delivery and patient education. Every effort was made to ensure the KPIs were understandable, objective, reliable, quantifiable and relevant to patient outcomes. They were developed for use as a measurement for internal benchmarking of the service and to improve quality of service. The KPIs are essential for the identification of further research needs in the lymphoedema sphere, highlighting both the successes and challenges in this field in general and of this service in particular.

### Strengths and limitations

The main strength of this study is that it is a unique Irish study in the specialist healthcare area of lymphoedema. This agreed KPI template offers an initial foundation for a national template of KPIs for lymphoedema services in the future. The study was limited by being in one site only.

### Conclusion

This is the first Irish study to identify KPIs relevant to lymphoedema services in Ireland. Professor Christine Moffatt

(CBE), a renowned clinical lymphoedema expert, offered a personal communication in recognition of the study: “Given the current massive public health problem facing us with the growing prevalence of chronic lymphoedema, health organisations have the moral and ethical responsibility to embrace Key Performance Indicators ensuring they can be translated into measurable reality.” The outcome of this study will be useful in informing the development of KPIs for similar HSE-led lymphoedema services nationwide, facilitating comparisons between the Irish and similar international lymphoedema services regarding best practice in the provision of care to those suffering from lymphoedema. The authors suggest a similar multi-site study could be undertaken following the current pilot study being undertaken to test the feasibility of the suite of developed KPIs at University Hospital Limerick, Ireland.

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