Casemix Measurement in Irish Hospitals

A Broad Outline of the Main Features

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Casemix Measurement in Irish hospitals

& the wider perspective:

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Introduction.

Thank you for your interest in Casemix.

This document is intended to serve as a broad outline to the Casemix programme in Ireland (a Brief outline is also available, on request).

Casemix is a programme that is simple in its concept, its aims, its strategy, but complex in its implementation. An enormous amount of work, including statistical expertise, goes into the development of Casemix, in order to ensure that it is a fair and realistic system (over 1,000 medical organisations, including specialist clinical panels, are invited to contribute to it's development). It would be almost impossible to document the entire subject.

Casemix is perhaps the best international system, transferable from country to country, for analysing a hospital’s throughput. It is also a constantly evolving management process. It does not stand still, either in the organisations around the world dedicated to its improvement, or in the institutions “Casemixing” hospitals, or those being “Casemixed”.

Hopefully, what follows gives a general introduction to the topic. However, if there are any particular areas on which you require more information, please feel free to contact us.

Casemix Unit
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Section A: What is Casemix?

In simple terms Casemix may be defined as:-

"the effective monitoring and COMPARISON, for management purposes, of ACTIVITY and COSTS between hospitals."

The clinical workload of hospitals varies greatly. Casemix is the attempt to categorise and quantify this “mix” of cases by classifying patients into discrete classes or groups (Diagnoses Related Group’s – DRG’s) which share common clinical attributes and similar patterns of resource use. The development of DRG’s provided the first operational means of defining and measuring a hospital’s case-mix complexity, and comparing it with other hospitals.

Casemix categorises each hospital’s caseload into discrete groups. This allows the comparison of activity and costs between different hospitals – the essence of casemix.

Basically, every patient who is admitted to a Casemix hospital has their age, gender, diagnoses, procedures and discharge status coded in an internationally acceptable coding system. This tells a hospital who their patients are, what age they are, where they come from, how long they stayed, what it cost to treat them, how often they were admitted to the hospital, etc., i.e. a comprehensive patient profile.

The key benefit of Casemix measurement is the extent to which it provides a common language for service planning, management and development that is meaningful to both clinicians and managers.

Casemix was introduced in an effort to collect, categorise and interpret data related to the types of cases treated in the hope that managers would be able to define their products, measure their productivity and assess quality.

Casemix is primarily a system to produce data on activity - almost nowhere in the world, even the US, is it used to allocate more than a portion of health-care funding. (See Note 1)
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Casemix is unique because it is the:-

• only system based on patient discharge data
  *(the most accurate data available)*

• only system using episode of care as the unit of analysis
  *(the most meaningful in terms of following actual practice)*

• only system which controls for complexity
  *(most relevant for accurate description of medical practice)*

• only system which attributes costs to cases on the basis of empirical studies of actual hospital cost behaviour
  *(i.e. time and motion studies)*
Section B: Why Casemix?

Casemix has many uses, ranging from the clinical to the financial. The rationale for the use of casemix systems as part of the budgetary process in countries like Ireland is the wish to base funding on measured costs and activity, rather than on less objective systems of resource allocation, and to fund hospitals based on their “mix” of cases.

WHAT CANNOT BE MEASURED, CANNOT BE IMPROVED.
Casemix is the comparison of activity and costs between hospitals, with measurement of hospital throughput at its core. Although originally developed in the USA, it has now become an internationally accepted management system (all European countries now use some form of Casemix), operating on all continents. Its benefits are that, apart from financial reimbursement, it generates extremely accurate activity / epidemiological data. In Ireland, it is the only audited management dataset for acute hospital activity, available.

Although there are many different versions of Casemix, tailored to local requirements, basically all systems operate by coding patients in acute hospitals to WHO standards and then classifying them in homogenous groups (Diagnosis Related Groups - DRGs) that are clinically meaningful and administratively feasible. A separate costs programme operates to collect the actual costs of treating these patients. The costs and activity are then merged, thus allowing each hospital’s throughput to be measured.

However, as hospitals traditionally have always resisted the move to compare their caseload with others, the Casemix process necessarily involves significant medical / statistical / accountancy and management input, to measure the very real differences that exist between hospitals. These skills have to be applied in a measured, structured manner, involving all stakeholders in the process, with agreement between the parties as to the accuracy of the final analysis and the rules of engagement.

Although the financial allocations are the “public face” of Casemix, in fact it is the activity and cost data that is possibly the more important aspect, and without which information such as:-
- Cost per case
- Numbers of operations
- Beddays used
- Transfer of patients between hospitals
- Treatment rates
- Operating theatre running costs
- Morbidity data
- Bedday costs by specialty
- Differing treatment patterns
- Data for national strategies
- International comparisons
- Readmission rates
Why Casemix?

You can't MANAGE (fund, assess, measure), any service or business unless you can QUANTIFY, CATEGORISE, COMPARE and COST it.

Casemix is a COMMON LANGUAGE for Managers & Medics, Civil Servants and Clinicians.

It allows you to COMPARE Irish hospital with Irish hospital and Ireland with the Rest of the World

The concept that in order to treat patients effectively, one must firstly categorise them, was suggested by Aristotle. An amazing amount of resistance to this concept still exists.

What can Casemix Analysis tell us?

It can tell us

~ what a hospital does or
~ what a hospital does relative to other hospitals

By grouping a hospital’s activity data, its workload can be described, analysed and compared in Casemix terms. This offers a valuable tool of analysis in that cases with similar clinical characteristics and patterns of resource use can be examined with reference to such factors as the number of cases treated in a particular specialty and their length of stay in the hospital. This can be used by individual hospitals, health boards, the department and others, to provide a profile of activity nationally, both within the individual hospitals or across hospitals. This data can be used in:-

~ service planning
~ identifying and supporting development needs
~ facilitating the development of clinical audit and quality assurance
~ supporting the development of clinicians in management initiatives

Casemix information is shared by all the hospitals participating in the national Casemix programme. This allows them to compare their performance in terms of length of stay and activity volumes with other comparable hospitals. It also allows them to look at county of residence data (for example, all health boards receive regular reports on where their health board area residents actually received treatment (e.g. patients in Galway being treated in Dublin), age profiles for treatment (e.g. hip replacements), readmission rates, number of visits per patient, per year.
Section C: The History of Casemix

The Greeks:
Disease classification, or more formally, Nosology, started with Aristotle, who established a framework for scientific investigation that is still used today. By the 18th Century was in vogue with efforts being made to describe the language of health in a consistent and comprehensive manner. Linnaeus (1707-1778) developed an extraordinarily sophisticated classification of mental diseases and The London Bills of Mortality (1701-1777) charted fatal diseases in London for the first time.

Casemix:
Casemix was introduced in the late 1970's in New Jersey in the USA, following the design and development of Diagnosis Related Groups (DRGs) by Yale University. The motivation for developing the DRGs was to create an effective framework for monitoring the quality of care and the utilization of services in hospitals. The New Jersey Department of Health used DRG's to pay hospitals for each patient treated. In 1983 the American Congress amended the Social Security Act to include a national DRG based hospital prospective payment system for all Medicare patients. See Note 2

In the past, hospital characteristics, such as teaching status or the number of beds, have been used to attempt to explain the substantial cost differences which exist between hospitals. However, such characteristics fail to account adequately for the cost impact of a hospital's mix of cases. Individual hospitals have often attempted to justify higher costs by contending that they treated a more "complex" mix of patients; the usual contention being that the patients treated were "sicker". Although there has been a consensus in the hospital industry that a more complex case mix results in higher costs, the concept of case mix complexity had historically lacked a precise definition. The development of the DRGs provided the first operational means of defining and measuring a hospital's case-mix complexity.

Where is Casemix used? See Note 2:
What is Casemix used for? See Note 3:
Section D: How Patients are classified:

HIPE activity

β

Coded in ICD-9

β

Divided into 25 MDC’s

β

Subdivided into 511 DRG’s

β

Further subdivided into

Medical/Surgical Diagnosis and/or Procedures

Approx. 12,000 diagnosis and 8,000 procedures

(i.e. a hospital’s patients might be divided into over 20,000 different categories, to allow comparison with other hospitals.)
The W.H.O. and I.C.D.'s:
The World Health Organisation publish, annually, the "International Classification of Diseases (I.C.D.)" for the classification of morbidity and mortality information for statistical purposes - this assists health organisations, world-wide, to "speak the same language". (In 1950, the U.S. Public Health Service and the Veterans Administration began tests on ICD for its use in storing hospital medical records. By 1959 the system had been consolidated for hospital indexing purposes. In 1962 the first classification of operations and treatments was included - see Notes. In Ireland ICD-9-CM is used, which divides the MDC's into 511 individual DRG's. This data is coded in the national HIPE programme).

The DRG system is based on the ICD system and divides all ICD principal diagnoses) into twenty-five Major Diagnostic Categories (MDC's), corresponding to a single organ system or aetiology (similar to specialties).

The 25 MDC's are:-
1. Diseases and Disorders of the Nervous System
2. Diseases and Disorders of the Eye
3. Diseases and Disorders of the Ear, Nose, Mouth and Throat
4. Diseases and Disorders of the Respiratory System
5. Diseases and Disorders of the Circulatory System
6. Diseases and Disorders of the Digestive System
7. Diseases and Disorders of the Hepatobiliary System and Pancreas
8. Diseases and Disorders of the Musculoskeletal System and Connective Tissue
9. Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast.
10. Endocrine, Nutritional and Metabolic Diseases and Disorders.
11. Diseases and Disorders of the Kidney and Urinary Tract.
12. Diseases and Disorders of the Male Reproductive System
13. Diseases and Disorders of the Female Reproductive System
14. Pregnancy, Childbirth and the Puerperium
15. New-borns and Other Neonates with Conditions Originating in the Perinatal Period
16. Diseases and Disorders of the Blood and blood forming organs and Immunological disorders
17. Myeloproliferative diseases and disorders and poorly differentiated neoplasms
18. Infectious and parasitic diseases
19. Mental diseases and disorders
20. Alcohol/drug use
21. Injuries, poisonings and toxic effects of drugs
22. Burns
23. Factors influencing health status and other contacts with health services
24. Multiple significant traumas
25. Human immunodeficiency virus infections.

Diagnosis Related Groups:
Diagnosis Related Groups (D.R.G.'s) were formed by subdividing the MDC's into DRG's. (List of DRG's available on request)

Medical / Surgical split:
Each DRG is subdivided into Medical or Surgical. There are approximately 12,000 Diagnosis and 8,000 Procedures

Section E: The Irish Perspective:
THE HISTORY OF CASEMIX IN IRELAND

1987:
• Work began in Ireland

1991:
• 15 acute hospitals prepared for introduction of Casemix
  (“specialist” hospitals (psychiatric, rehabilitation, orthopaedic, maternity)
  hospitals not in Casemix)

1993:
♦ First 15 1hospitals had a portion of their budgets adjusted by reference to
  their Casemix "performance" using a “Blend-rate” of 5%

1994:
• “Blend-rate” increased to 10%
• A total of 8 new hospitals join Casemix2. (Total up to 23)
  ♦ Only Inpatients included in Casemix at this point.

1995:
• Blend-Rate increased to 12.5%.

1996:
• Casemix introduced for Day-cases (at 1% blend-rate)
• "Blend-rate" for inpatients increased to 15%
• Workload adjustment introduced
• 3 new hospitals join (Monaghan, Navan, Tralee – total up to 26)

1997:
• Casemix Day-case “Blend-rate” increased to 5%
• Merlin Park & Loughlinstown join Casemix – total 28

1998:
• St Luke's Kilkenny & Wexford join Casemix – total 30

1999:
• Mallow & St. Mary's Orthopaedic join Casemix, but Adelaide & Meath
  leave temporarily due to move to Tallaght – total remains 30

2000:
• Croom orthopaedic joins Casemix – total 31

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1 Beaumont, CUH, JCMH, Mater, Meath, St James, St Vincent’s, UCHG, Limerick, Drogheda, Mayo, Mercy, Sligo, Tullamore, Waterford
2 Adelaide, Cavan, Letterkenny, Mullingar, Loughlinstown, Portiuncula, Portlaoise, Sth Vic
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♦ Two private hospitals join HIPE, bring total to 62.
♦ Maternity Casemix project commenced (with a view to bringing them into Casemix).
♦ Work underway to commence paediatric hospitals project.
♦ MDC 14 (Childbirth etc.) included into Casemix.

2001:
♦ The Adelaide, Meath & NCH (Tallaght) join Casemix bringing total to 32 hospitals.
♦ A comprehensive “Root-and-branch” review of the entire Casemix system in Ireland commenced, with a view to improving the present system already in place, expanding the number and type of hospitals involved, increasing blend-rates, and expanding Casemix to areas such as Outpatients and A+E - ie every patient encounter with an acute hospital.
♦ MDC 19 (Mental disorders) still excluded

2002:
♦ Inpatient blend-rate increased from 15% - 20% and Daycase blend-rate increased from 5% - 10% (w.e.f. 1/1/2003)
♦ Funding methodology changed from “into-the-base” to “one-off”
♦ “Root-and-branch” review of casemix systems continued, including pilot of ICD-10

2003:
• Review of coding and review of Groupers to be incorporated into final “Root-and-branch” review report this year
• Coombe, Rotunda and Holles Street Maternity hospitals Casemix project ongoing – costs being submitted this year - with the intention of including all three in Casemix w.e.f. 1/1/2004
• New Specialty Costing guidelines drawn up – various proposals to be agreed before next budget run
• Paediatric project ongoing, with the intention of including Temple Street and Our Lady’s Crumlin in Casemix – costs to be submitted in 2004 – with the intention of including them in Casemix w.e.f. 1/1/2005
1. Background:
   The Commission on Health Funding (1989) was established to consider, inter-
   alia, hospital waiting lists.

   The terms of reference for the Commission were:

   "To ensure the financing of the health services and to make
   recommendations on the extent and sources of the future funding required
   to provide an equitable, comprehensive and cost-effective public health
   service and on any changes in administration which seem desirable for
   that purpose"

   In their conclusion they stated:

   "Each hospital should be funded for the provision of an agreed level of
   service to public patients, based on the activity level implied by its role
   and catchment area, and the case-mix based cost of meeting this.
   Techniques such as DRG's should be used to determine the level of
   funding ...

Introduction:
   A National Casemix Project was established in 1991 and the first financial
   allocations were implemented in 15 hospitals for the 1993 Financial
   Allocation. The programme has been expanded year-by-year. The
   information gathered is shared by all the hospitals participating in the national
   Casemix programme. This allows them to compare their performance
   activity with other comparable hospitals. It also allows them to look at county
   of residence data; age profiles for treatment; readmission rates; number of
   visits per patient, per year; whether patients are being treated on an inpatient
   or daycase basis (both in their own hospital and other hospitals). More and more
   hospitals are actively using this data as part of the management function.

   Casemix works by:
   ~ coding hospital activity (the HIPE programme) and
   ~ assessing hospital costs (the Specialty costs programme)
The HIPE (activity) Programme:
The HIPE programme presently operates in the 62 biggest hospitals in the country, and now includes 2 private hospitals (the ESRI manage the collection process on behalf of the Department of Health). When a patient is discharged, their Age, Gender, Diagnosis, Procedures performed and Discharge Status is coded using the World health Organization's International Classification of Diseases (I.C.D.), which allows for 12,000 diagnosis and 8,000 individual procedures, each of which is allocated a separate code. Over 800,000 cases a year are coded. The data is then grouped into 511 Diagnosis Related Groups (in an effort to make the data more meaningful). The basis of the entire coding system is to break down illnesses into 25 Major Diagnostic Categories (M.D.C.’s) based around body parts (e.g. diseases of the eye, etc.), in much the same way as Specialties operate.

Example:
A patient with bronchitis & asthma would be categorized as one of the following:-
- being under17 years without complications
- being under 17 years with complications or
- being over 17 years

this allows patients to be categorized into discrete groups for analysis so that even patients in different types of hospitals can be compared.

(See Appendix 7 - HIPE Record - ie what is recorded on HIPE)

The Specialty Costs Programme:
Cost data, based on information derived from the audited accounts of 34 of the 62 HIPE hospitals, is broken down across 16 cost centers (theatre, nursing, laboratory, etc., and apportioned to each specialty in the hospital. These costs are then allocated to the 511 Diagnoses Related Groups (DRG’s), giving an average cost per case.

Casemix is the combining of the activity and cost data to give an average cost per case, length of stay and resource use, relative to other activity in the hospital and elsewhere.

In Ireland, Casemix is used for acute hospital activity only, (Inpatients and Day-patients only), but abroad it is being used to classify different types of patients, such as Outpatients, and to compare individual hospital episodes and complete "episodes" of care (from GP visits through to hospital and rehabilitation) and it is used in acute hospitals, nursing homes, for mental handicap groups, etc. Every country in Europe uses Casemix for some purpose.

In 2000, 34 of the 62 "HIPE" hospitals were involved in the Casemix programme and had a percentage of their budget adjusted based on their Casemix performance. Only a percentage of their budget is adjusted in this way. The entire exercise is budget-neutral (i.e. the Department does not gain from the exercise - money deducted from hospitals below the mean is given to hospitals above the mean), in an effort to reward good management. It should be borne in mind that great effort is made to compare like-with-like (the essence of Casemix) and take account of different hospitals mix-of-cases (for example, teaching hospitals are grouped separately).
The number of hospitals involved increases each year and the percentage of the budget allocated through Casemix adjustments is also, generally, increasing.

Although the system is geared towards the most accurate cost per case figures possible, the main thrust of the programme is the comparison of hospitals vis-à-vis their peers, the identification of resource usage in individual hospitals, assisting managers to manage, it is not used to fund hospitals (only €1.89bn of the entire health budget is “Casemixed”, which results in negative adjustments of €6.4m, which are then reallocated as positive adjustments of €6.4m). This amounts to less than 1% of the overall budgets for the hospitals in the programme), and is not designed (in Ireland, at present) to set a gold-standard price per case treated. Also, data which is statistically small, or skews the overall data, is removed in order that the remaining data reflects like with like.

The diagram below shows how the costs and activity for each Casemix hospital are derived:

**Types of hospitals in Casemix:**
The range of hospitals varies from large inner-city to small rural; from general acute to specialist (e.g. orthopaedic); from health board to voluntary. The greater the number and range of hospitals involved, the better the comparative data is.

**Quality of Care**
While the programme does not deal explicitly with quality of care as an issue (e.g. the department does not set the standards for length-of-stay - it is the peer group performance that does) at present, it allows individual hospitals to examine matters such as readmission rates, which would be affected by treatment protocols. The Casemix programme has never advocated efficiency replacing equity or quality of care, in fact, Casemix assists in the effort to improve both.
Conclusion
Casemix is the only detailed, audited, dataset of hospitals activity and costs. The system is designed to be administratively feasible and cost effective (i.e. the cost of collecting the data must not be more than its value - at present that cost is approx. €9 per case, while the cost of treating an average case is €3,467 and collecting the data must not be an unreasonable administrative burden). The Casemix programme is the result of a collaborative effort by everyone involved, from the doctors, administrative staff, management, the ESRI and the department.
1. Specialty Costs:
Cost data based on information derived from 31 hospitals audited accounts (collected by the Department's Finance Unit through its Specialty Costing Programme) and analysed by specialty across 16 main cost centres (theatre, nursing, laboratory, etc. - see Appendix 6)

```
Casemix
   / \   \
   /   \   \
   /     \   \
Activity + Costs
   \   /   \   /
   \ /   \ /   /
   \ /   \ /   /
   Budget Adjustment
```
3. **The Budget Model:**
A Casemix budget model was developed by the Department of Health with the assistance of SOLON Consulting, a US health economics consultancy. This model uses Casemix data grouped into HCFA 12.0 (Health Care Financing Administration) DRG's and assigns costs to this activity (we have just introduced HCFA 16.0 - a increment of 4 updates). The model operates on the basis of comparison of hospitals costs, taking account of case-mix complexity, with peer hospitals - i.e. the overall performance of the entire group sets the standard by which individual hospitals are measured.

The budget adjustment for any given year is calculated retrospectively using the most recently available complete year’s costs and activity data (e.g. the 1999 Casemix adjustments were calculated using the cost and activity data for the calendar year 1987).

**Blend Rate:**
Casemix is only used at a blend-rate of 20% for Inpatients, 10% for Daycases

- "Blend-rate" (now) 20% - i.e., 20% of the difference between what the hospital budget is and what Casemix estimates it should be.

- The overall budget adjustment is varies between +/- 3% of the hospitals Casemix budget (the portion of the budget “Casemixed”).

- In Ireland, Casemix is budget "neutral" i.e. all losses and gains remain within the participating hospitals.

\[
\text{Casemix Adjustment} = \frac{\text{Actual hospital costs} - \text{Casemix budget costs}}{\text{Difference} = \text{real loss/gain}}
\]

REDUCED as follows ....

Daycases @ 10% and Inpatients @ 20% OF DIFFERENCE
Teaching hospitals:
In Ireland, the difficulty of dealing with the higher cost-per-case in teaching hospitals vis-à-vis non-teaching hospitals was dealt with by putting all Casemix teaching hospitals into a separate group, in order that their performance and costs would only be compared to one another. The other non-teaching hospitals are in a second Casemix group.

Daycases:
The 1996 Casemix budget allocation included an adjustment of just 1% in respect of daycase activity for the first time.

The system presently in use is a Canadian system called DPG's - Day Patient Groups.  
See Note 5

Relative Values:
Relative values (R.V.’s) of DRGs are the relative costliness of one DRG versus another. A case of exactly average cost has an R.V. of 1, with more costly than average cases having R.V.’s of more than 1, and less costly than average less than 1. This is a very useful tool for comparing, for example, the cost of tonsillitis patients (0.5) versus liver transplant patients (40.0).

Casemix (hospital) Index:
This is a measure of the complexity of a hospital's workload.

\[
\text{Relative Value per DRG (NATIONALLY)} \times \text{No of cases per DRG (IN THE HOSPITAL)} = \text{Hospital Index (CMI)} \]  
(Complexity of hospital's caseload)

For a Worked Example (sample): - See Note 4

Cost of Casemix in Ireland:
The cost of implementing the National Casemix Programme in Ireland is approximately €6 per case, with the average cost of treating a case being €2910 (based on 2001 cost data). However, obviously the Casemix data is also being used for epidemiological purposes (statistics, etc.) so the real cost is far less.

The cost includes all coding staff in hospitals, management, the ESRI and the Department of Health.

The world-wide picture:
Around the world, more and more countries are using some form of Casemix (different countries have developed different forms of the original Casemix system, which they consider more applicable to local circumstances), for different areas of health care. In Ireland, Casemix is only used in the acute hospital area at present.

Numbers of Hospitals Involved in Ireland:

Government White Paper on Health Insurance:
The recently published white paper gave a commitment to move to a preferred (Casemix-based) system of risk equalisation by June 2002. A feasibility study is to be undertaken as a matter of urgency. This gives further impetus to the national Casemix programme.

Conclusion:
In the 2001 budget adjustments, 32 of the 62 "HIPE" hospitals were involved in the Casemix programme and had a percentage of their budget adjusted based on their Casemix performance. Only a percentage of their budget is adjusted in this way. The entire exercise is budget-neutral i.e. the Department does not gain from the exercise - money taken from below the "mean" is given to hospitals above the "mean". The number of hospitals involved increases each year and the percentage of the budget allocated through Casemix adjustments is also, generally, increasing.
Section F: Who uses Casemix and Where?

Casemix is presently used in on every continent. These are some of the countries, among others ........

Albania, Australia, Austria, Belgium, Bulgaria, Costa Rica, Czech Republic, Denmark, France, Germany, Hungary, Italy, Israel, Mexico, the Netherlands, Norway, Portugal, Romania, Russia, Spain, Switzerland, Sweden, U.K., USA etc., etc.

Every country in Europe now uses Casemix in some manner.
In the 2001 budget adjustments in Ireland, 34 of the 62 "HIPE" hospitals were involved in the Casemix programme and had a percentage of their budget adjusted based on their Casemix performance. Only a percentage of their budget is adjusted in this way. The entire exercise is budget-neutral i.e. the Department does not gain from the exercise - money taken from hospitals below the mean and given to the hospitals above the mean. The number of hospitals involved increases each year and the percentage of the budget allocated through Casemix adjustments is also, generally, increasing.

Even in the US, where Casemix has been used deliberately to lower costs, studies have shown

~ that it was the voluntary co-operation of the clinicians themselves that made the system work and
~ although the rate of increase in costs was slowed, there was no lowering of standards of patient care,
Section H: Your Questions Answered:

1. **What is Casemix?**
   Casemix is the comparison of activity and costs between hospitals
   - Activity is the HIPE Programme and
   - Costs are the Specialty Costs Programme

2. **Where does Casemix operate?**
   - In Ireland: In 34 public hospitals (with HIPE operating in a further 28)
     (Including 2 private).
   - In every European country and on all continents

3. **What is Casemix used for?**
   - Budgeting
   - Planning (national strategies, local developments, new units, trends, etc.)
   - Epidemiological data (coded to WHO standards) (cancer/cardiac etc.)

4. **Why Casemix?**
   What cannot be measured cannot be improved.

5. **How long has the programme been running?**
   The HIPE programme started in the 80’s and the Casemix programme stated in 1991
   with the first financial adjustments being applied for the 1993 financial allocation.

6. **Is Casemix an Irish system for Irish patients?**
   Yes. Although the system in use is an international system, it is adapted for Irish
   hospital systems, cost and patients

7. **Who sets the standards?**
   The Peer Group - DoHC do not set any guidelines - everyone is compared to
   the mean.

8. **Who makes the decisions?**
   A Casemix group within the Department oversee the national strategy. The group has
   representatives with a diversity of skills including: medical, statistical, acute hospitals
   and accountancy, with a national co-ordinator acting as liaison between the group and
   all the stakeholders in the process. The ESRI have a special unit dedicated to the
   collection and validation of HIPE data, and assist the Department in many wide-
   ranging projects to study the data.

9. **Are the hospitals represented in the decision making process?**
   Yes. Every effort is made to increase stakeholder participation in the process. Open-
   Day’s; Lectures/talks; Annual Conference; are held in hospitals, Health Boards, the
   Department itself; neutral venues, are all geared towards making the process as open
   / transparent / fair and representative as possible.

10. **Are the Department using Casemix to save money?**
    No. The process is what is called “budget neutral” - that is, funding taken from any
    hospital below the mean, is redistributed to hospitals above the mean. Usually, there
    is the same number of hospitals above and below the mean. It is aimed at rewarding
    good performance.

11. **What amount of a hospital budget is funded through Casemix?**
The maximum at present is 20% for inpatients and 10% for daycases, but many hospitals on the mean neither gain nor lose. The Casemix budgetary process determines the mean cost per case for both inpatients and Daycases. If a hospital is at the mean, then they will receive the 20%. If they are below the mean, then they will lose some of that 20%. If they are above the mean, then they will gain extra. This is increasing slowly over time, allowing hospitals time to adapt to the new regime. If, for example, they are €100 dearer/cheaper/per case, then the will lose/gain €20 for each inpatient or €10 for each daycase treated. This is known as the “blend rate” (20% for inpatients and 10% for daycase).

12. **What is the average loss/gain?**
   Adjustments vary between, on average, + / - 3% of Casemix budget (the portion of their budget “Casemixed”, which is usually about 60% of the hospitals overall budget. Usually they are no more than 1% of the overall budget.

13. **Does the DoHC penalize hospitals for keeping patients too long?**
   No. There are many reasons why hospitals lose in Casemix; long length of stay is only one. The Casemix Budget Model actually gives hospitals credit for long stay patients - it is only where they greatly exceed the norm for the entire country that they suffer. The average length of stay which emerges from the Casemix process is arrived at on the basis of clinical practice in hospitals throughout the country. Casemix does not dictate or lay down arbitrary parameters regarding length of stay for patients in public hospitals. The clinicians remain responsible for admitting and discharging patients. **However, long length of stay does not necessarily equate to good care.**

14. **What is the justification for taking money off hospitals?**
   Accountability is one of the cornerstones of public policy. For every hospital that is penalised, one is rewarded. The system highlights variances in performance, both between hospitals and even within hospitals themselves. This assist management to establish which issues need to be addressed. In fact, it is the Casemix data itself that facilitates hospitals to address funding issues for particular services.

15. **Surely every hospital is different?**
   Yes, but like compared with like only - the workload divided into 511 Diagnosis Related Groups and each hospital’s activity in each DRG (if any) compared with the mean. Account is taken of each hospitals complexity

16. **Do we assist hospitals in the Casemix programme?**
   Yes, ongoing assistance is available to all hospitals wishing to develop their Casemix skills.

17. **Do we take account of “special” circumstances?**
   Yes, any area of activity that cannot be accurately compared with other sites is omitted or amended.

18. **What’s the future of Casemix?**
The system is being constantly refined and expanded. Over the next few years all hospitals, with enough admissions to justify the cost of collecting the data, will be included. Areas such as Outpatients and A & E may also be included (at present broad data on these areas is collected, for national data-sets purposes, but is excluded from the Casemix budget model).

19. **What about ..........?**
Every aspect of the Casemix system is kept under review. At present, projects are underway to do a root-and-branch review of the entire system. Hospitals are kept abreast of developments, and are included in the process.

Most Health Boards have a HIPE / Casemix Co-ordinator to oversee the programme in their board’s area. Each hospital represented in the programme has a HIPE / Casemix Co-ordinator, all of whom have direct access to the Casemix Unit in the department.

20. **What does the programme cost?**
Approximately €9 per case "Casemixed" – in 2003 the average cost of treating an inpatient case was €3,467. A cornerstone of the programme is that it be administratively feasible and cost effective. The cost is not just for applying Casemix Budgets; it is for collecting all the epidemiological data relating to each case, auditing it, training the coders and keeping the system up to international (WHO) standards.

21. **What is a Specialty Costs Programme?**
The Costs Programme collects costs for participating hospitals. The costs are derived from the Annual Accounts of the hospital (not estimates) and are allocated, by the hospitals, under heading such as salaries, radiology, labs, drugs, etc. Costs are basically Consultant driven – i.e. the cost of supporting each consultant and his/her team is identified, and apportioned to the patients that team has treated, in order to obtain a cost per case treated.
Appendix 1

Glossary of Casemix terminology:

**Daycases:**
A daycase is a patient who is admitted (under the care of a consultant) and discharged on the same date; who is admitted on a planned basis, and discharged home or to another institution (not died). To be included in the budget model they must have had a procedure, listed on the Daycase Inclusion List - otherwise they are considered a non-Casemix case (and receive a lesser credit in the budget model). The technical definition is:-

"...a patient who is admitted to a hospital (under the care of a consultant), on an elective basis for care and/or treatment which does not require the use of a hospital bed overnight and who is discharged as scheduled"

**D.R.G.:**
Diagnosis Related Groups: (An up-to-date list of DRG’s currently in use is available on request).

While all patients are unique, groups of patients have demographic, diagnostic and therapeutic attributes in common that determine their level of resource intensity. By developing clinically similar groups of patients with similar resource intensity, patients can be aggregated into meaningful patient classes. DRGs are a patient classification scheme consisting of classes of patients who are clinically similar and have similar resource usage.

DRGs need to be:-

- based on information routinely collected
- be a manageable number to encompass all patients seen
- each DRG should contain patients with a similar pattern of resource usage
- each DRG should contain patients who are similar from a clinical perspective

**H.I.P.E.:**
Hospital Inpatient Enquiry - the national programme devoted to collecting acute hospital inpatient (originally) activity.

**I.C.D.:**
The International Classification of Diseases is published by the World Health Organisation for the classification of morbidity and mortality information for statistical purposes. In 1950, the U.S. Public Health Service and the Veterans Administration began tests on ICD for its use in storing hospital medical records. By 1959 the system had been consolidated for hospital indexing purposes. In 1962 the first classification of operations and treatments was included.
Over 1,000 health organisations are given the opportunity to contribute to the updating of this classification.

**I.C.D.9-C.M:**
This is the "clinically modified" (CM) version of the codes. Co-operating parties are the American Health Association (who publish data and coding guidelines) and the American Health Institute Medical Association (who collect ICD data and deal with education and training of coders). ICD-9 refers to the diagnosis and “C.M.” refers to the list of procedures.

The Health Care Financing Administration (H.C.F.A.) are responsible for updating the Procedures concerned, and the National Centre’s for Health Statistics are responsible for updating the Diagnosis. A new classification is published on 1 October each year. Presently (1998) ICD-10 is the most up-to-date classification. Work is underway to publish ICD-10-CM, which is expected in 2002.

♦ Diseases are classified in many ways, for example aetiology, clinical manifestations, anatomy, morphology, etc. ICD-9-CM uses multiple axes of classification, for example the primary axis of disease classification as a whole is by **anatomy** (e.g. diseases of the respiratory system, etc.) or **aetiology** or cause.

**H.C.F.A.:**
HCFA is the coding system presently in use in Irish hospitals (the ESRI have responsibility for the training of coders in hospitals and the collection / validation of data before issue to the department of health. The HCFA codes take the data (which is coded in ICD format) and puts it into DRGs. In 1999 HCFA 16 (16th version) was introduced into hospitals for coding of 1999 data, while previous years data continues to be coded in HCFA 12 (12th version). Each new version of the grouper allows for medical/surgical developments, including new procedures.
Appendix 2

Notes

Elaboration of items referred to earlier:

Note 1:
Health care costs in the U.S. spiralled out of control after the second world war, with an increase of 26,000 percent over 56 years - outpacing general inflation by a ratio of 25 - 1. Between 1946 and 1982 the number of general hospitals increased by 32%; the number of beds by 115%; the number of admissions by 170% and spending on hospital services alone by over 800% above inflation. Presently the US spends 13% of GDP on health care - more than any other country in the world (while 15% of the population have no health care coverage at all).³

Note 2:
The state of Victoria in Australia is one of the few “countries” that are using Casemix as a primary tool to finance acute hospitals, bring their funding back from the historical system, to a real-life, payment-per-case, system. Even in the US, the birthplace of Casemix, it is only used for funding Medicare patients, and even then, only used as a benchmark from which to start negotiations on funding.

Note 3: What is Casemix used for?

Areas of activity:
Quality
Costs
I.T.

Patient types:
Inpatients
Outpatients
Daycases
Episodes of care
Ambulatory care

Hospital types:
Acute hospitals
Nursing Homes
Mental Handicap Groups

Note 4: A worked example of a Casemix adjustment, using a blend rate of 15%.

St. Zoe's Hospital
Inpatient Budget

Costs: £35,000,000
Cases: 16,000
=£2,200 per case

Compensate for Complexity
CMI=1.3

Casemix cost per case
= £2,200 divided by 1.3 =
£1,690 per case
(i.e. a case with a CMI of 1 in this hospital would be £1,690)

Group 1 cost per case = £1,640 (At CMI of 1)
Difference = £50 per case
x 16,000 cases = £0.8m
15% of £1m = £120,000
Note 5: **Daycases:**
Analysis of HCFA DRGs confirmed that they were unsatisfactory for classifying daycase activity, since the same procedure codes were being assigned to different DRGs depending on the diagnosis.

So, for the 1996 Casemix budget allocation, an adjustment of just 1% in respect of daycase activity was included for the first time. The system used was based on ambulatory Surgical Centres (ASC’s) which grouped daycase activity into just nine categories by reference to resource usage. However, the ASC’s had no clinical meaning and their small number ruled them out as a continuing option.

A Canadian system (DPG’s - *Day Patient Groups*) had been developed by the Canadian Institute for Health Information (CIHI) for specific use in a daycase setting. While the system had limitations, it had practical application, especially in the short-term.

Studies are ongoing (especially with the move towards daycase work in hospitals) to provide a system that better reflects daycase activity.
Appendix 3

Some Statistics:

Amount of acute hospital budget “Casemixed”:
The budgets of the 34 hospitals in the Casemix programme amount to approximately £3.07 billion. The amount of these hospitals budgets that are covered by the Casemix programme is £1.8 billion. The Casemix adjustments, both positive and negative, amount to approximately £6.4 million.

Numbers (approx) attending hospital in 2002:

Daycases 405,000
Inpatients 557,000
Casualty 1,209,000
Outpatients* 2,172,000
Total 4,343,000

*Based on 2001 provisional data

Average cost per case:

2001 cost data:
Inpatient £2,913
Daycase £604
A & E £148
Outpatient £136
Appendix 4

Hospitals in HIPE:

ERHA area:
St. Mary's Hospital, Phoenix Park
St. Columcille's Hospital, Loughlinstown
Naas County Hospital
Cherry Orchard Hospital
James Connolly Memorial Hospital
St. James's Hospital, Dublin
Mater Misericordiae Hospital, Dublin
St. Vincent's Hospital, Elm Park
St. Michael's Hospital, Dun Laoghaire
Beaumont Hospital, Dublin
Peamount Hospital, Newcastle
Coombe Women's Hospital, Dublin
National Maternity Hospital, Holles St, Dublin
Rotunda Hospital, Dublin
Temple St. Children's Hospital, Dublin
Our Lady's Hospital, Crumlin
Hume St. Hospital, Dublin
St. Luke's & St. Anne's Hospital, Dublin
Royal Victoria Eye & Ear Hospital, Dublin
Incorporated Orthopaedic Hospital, Clontarf
St. Mary's Hospital, Cappagh
St. Mary's Auxiliary Hospital, Baldoyle
Our Lady of Lourdes Hospital, (NMRC), Dun Laoghaire
Our Lady's Hospice, Harold's Cross, Dublin
St. Joseph's Unit, Harold's Cross
Tallaght Hospital (Adelaide, Meath and National Children’s Hospital)

Midland Health Board
Portlaoise General Hospital
Mullingar General Hospital
Tullamore General Hospital

Mid-Western Health Board
Regional Hospital, (Dooradoyle) Limerick
Regional Maternity Hospital, Limerick
Regional Orthopaedic Hospital, Croom
Nenagh County Hospital
Ennis County Hospital
Casemix Measurement in Irish Hospitals – A Broad Outline of the Main Features

**North-Eastern Health Board**
Dundalk County Hospital
Cavan General Hospital
Our Lady's County Hospital, Navan
Monaghan County Hospital
Our Lady of Lourdes Hospital, Drogheda

**North-Western Health Board**
Letterkenny General Hospital
Sligo General Hospital

**South-Eastern Health Board**
Waterford Regional Hospital (Ardkeen)
St. Luke's Hospital, Kilkenny
Orthopaedic Hospital, Kilcreene
Wexford General Hospital
St. Joseph's Hospital, Clonmel
Our Lady's Hospital, Cashel

**Southern Health Board**
St. Mary's Orthopaedic Hospital, Gurrenabraher
Mallow General Hospital
Bantry General Hospital
St. Finnbarr’s Hospital, Cork
Cork Regional Hospital
Erinville Hospital, Cork
Tralee General Hospital

**Western Health Board**
Regional Hospital (UCHG), Galway
Regional Hospital, Merlin Park, Galway
Castlebar County Hospital
Roscommon County Hospital
Ballina District Hospital

**Voluntary Hospitals**
Mercy Hospital, Cork
South Infirmary/Victoria, Cork
St. John's Hospital, Limerick
Portiuncula Hospital, Ballinasloe
Appendix 5

Hospitals in Casemix:

Beaumont
Cork University
James Connolly
Mater
St. James’
St. Vincent’s
U.C.H. Galway
Cavan
Croom
Letterkenny
Limerick
Longford/Westmeath
Lourdes Drogheda
Louth General
Mallow
Mayo General
Mercy
Merlin Park
Monaghan
Navan
Portiuncula
Portlaoise
Sligo
St. Columcille’s
St. Luke’s Kilkenny
St. Mary’s orthopaedic
South Victoria
Tallaght (Adelaide, Meath and National Children’s Hospital)
Tralee
Tullamore
Waterford Regional
Wexford General

Appendix 6
Specialty Costs:

Specialty costs are collected in the "Casemix" hospitals only. Costs are derived from the audited accounts and, for Casemix purposes, only costs relating to specialty work undertaken i.e. "specialty costs" is incorporated into the Casemix specialty costs.

Hospitals are required to make returns, for each specialty, under the following headings:-

- OR
- Drugs
- Radiology
- Laboratory
- Supplies
- Other medical supplies
- ICU
- Hotel
- Physician
- Blood
- Anaesthetics
- Mis Medical Supplies
- Radiotherapy
- Admin 1 - NMS
- Admin 2 - Ma/Na/Ms
- Admin 3 - General admin

The grouping software takes account of which DRG's fall under each specialty. The costs are distributed by DRG (where activity has taken place) in relation to the number of cases coded.

Some of the 16 headings are "weighted" statistically, by individual DRG. Others are calculated in relation to the length of stay of patients, etc. For example, blood tests for DRG’s under craniotomy might be more expensive than blood tests for appendicitis.
Appendix 7

The HIPE Record:

HIPE coders are trained by the E.S.R.I. (who is charged with the responsibility of collecting the HIPE data on behalf of the Department of Health) to international standards. The hospitals send the data to the ESRI on a monthly basis. The ESRI then validate the data, before transmission to the Department of Health.

HIPE collects the following data:

**Basic Patient Discharge Information**
- Medical Record Number
- Admission Date, Discharge Date
- Date of Birth
- Sex
- Source of Admission
- Type (priority) of Admission
  - (admission deferred / normal admission / planned repeat admission / transfer for other acute hosp emergency:- (1) self inflicted; (2) emergency/RTA; (3) Home accident; (4) other injury; (5) other than injury; (6) readmission)
- Transfer from
- Discharge Code
- Transfer to

**Patient Details**
- Name
- Medical card
- Area of residence
- Admission Status
- Marital status
- GMS number
- Discharge Status
- Day case
- Admitting Consultant
- Days (or part thereof) in an intensive care environment
- Days (or part thereof) in a Private/Semi private bed

**Diagnosis:**
- Code x 10
- Description x 10
- Consultant x 10 and Specialty

**Procedures / Operations:**
- Code x 10
- Description x 10
- Consultant x 10
Date of 1st procedure and Date of Principal Procedure

Further information may be available from the PAS (Patient Administration System) and may be stored with the record.