Issues In Constructing Cost Weights

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Some Terminology

Price Paid = Weight × Unit Price

Where

Weight is a **relative value score** based upon cost (or sometimes charges).

The unit price is often called the **conversion factor** because it converts a relative value score into a $ value.

Different countries/projects tend to use different words for the same concepts.

Why Do We need Weights

Given that there are typically about 700 DRGs it is difficult to negotiate the price of each DRG separately.

It is easier to negotiate a single unit price and establish an agreed process for setting weights.

Weights should be proportional to the cost otherwise some DRGs will be more profitable than others.

Defining Weights

Weight DRG_i = Average Cost DRG_i ÷ "Reference Cost"

Where the "reference cost" can be:-

- The overall average cost for all DRGs
- The average cost for specific indicator DRGs
- A Benchmark average cost
- Any agreed number

The Choice of "reference cost" is important because it impacts on annual negotiations about unit price.

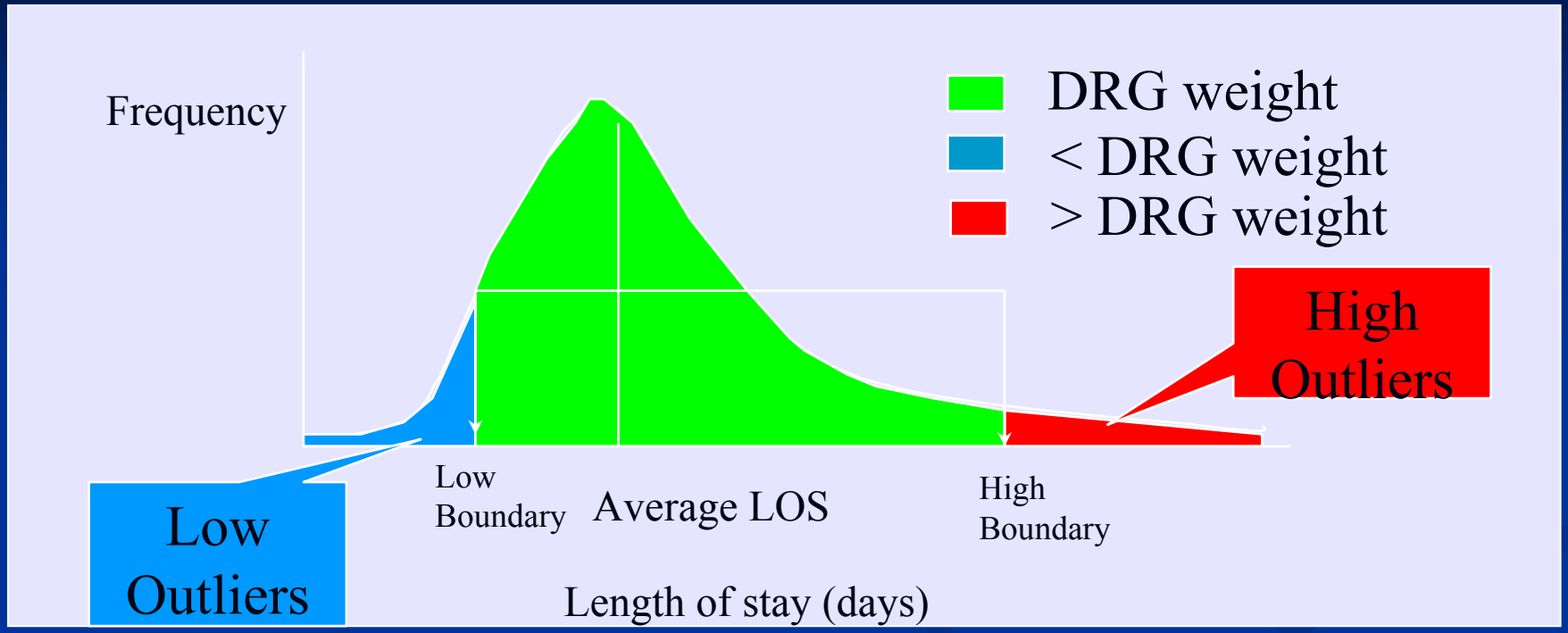
Issues in Defining Weights

- Defining the average cost
- Measuring the average cost
  - Normative costs
  - Cost modeling
  - Clinical Costing
- Defining the “reference cost”

Defining the Average Cost

- Which costs are included
  - Are all costs incurred by the hospital
  - Is there a separate funding/financing mechanism for some costs
- Which types of patients (are specific groups excluded through policy)
  - Specific procedures
  - Same day patients
  - Outliers

Issues with Outliers



Setting the high and low boundaries can effect the profitability of the DRG – usually you exclude too many high cost cases so that the weight is reduced. eg Mechanical Ventilation DRGs in Victoria

May need to retrospectively adjust the weight.

Measuring the "Average" Cost

- Approaches
  - Normative weights
  - Weights using cost modeling software (to DRGs)
  - Weights using clinical costing software (to patients or patient days)
  - Weights using hospital billing data
    - Fee Charged ≠ Cost
    - Reinforces any existing inequities
- Specialist costing software exists to allocate costs to DRGs or patients

Normative Cost Weights

- Clinical consensus what should be done to a patient with a specific clinical condition → clinical pathway development
- Estimate the cost of each component of care
- Add the costs to get the total cost for the clinical condition

- Strength: Based upon what "should be" not "what is" → Best Practice
- Weakness: Difficult to do → limited extent

Cost modelling – Data Requirements

- Patient level data allocated to DRG
  - Time spent in each part of the hospital
- Allocation statistics eg
  - Staff numbers (for administration costs)
  - Bed days (for meals)
  - Floor space (for cleaning)
- Service Weights eg
  - Nursing estimated per diem costs per DRG
  - Theatre estimated costs per DRG
  - Drug costs estimated per DRG
- Cost Centre Accounting

Cost Centre Accounting

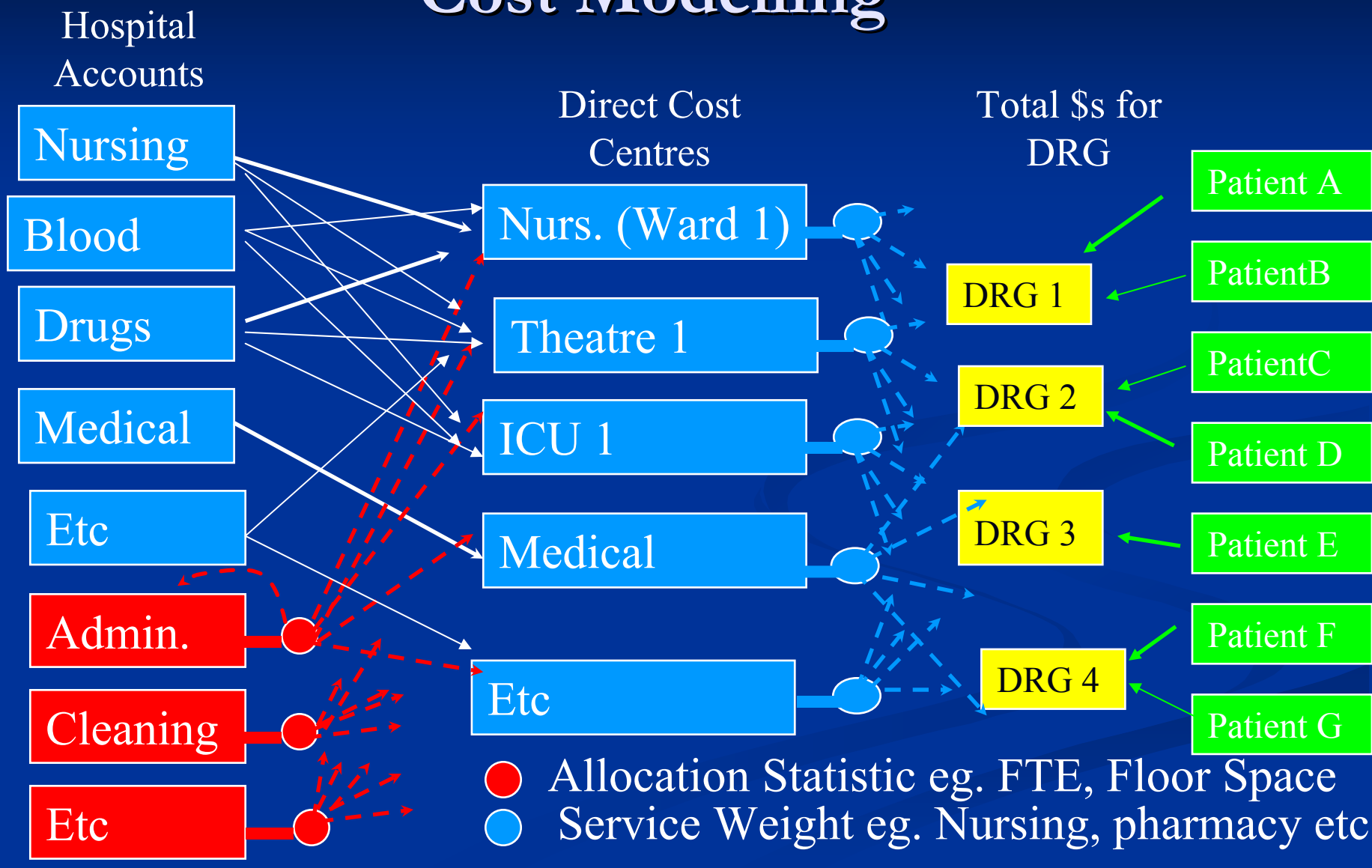
- All the hospitals be allocated into a table :-

Cost Centres (what's of interest to the hospital)

Cost Codes eg	Ward1	Ward 2	Theatre	Supplies	Drugs	Imaging	etc
Nurse's Salaries							
Doctor's Salaries							
Other Salaries							
Drugs							
Surgical supplies							
Cleaning							
etc							

- The more detailed the information the better the cost estimates

Getting the Average Cost per DRG : Cost Modelling

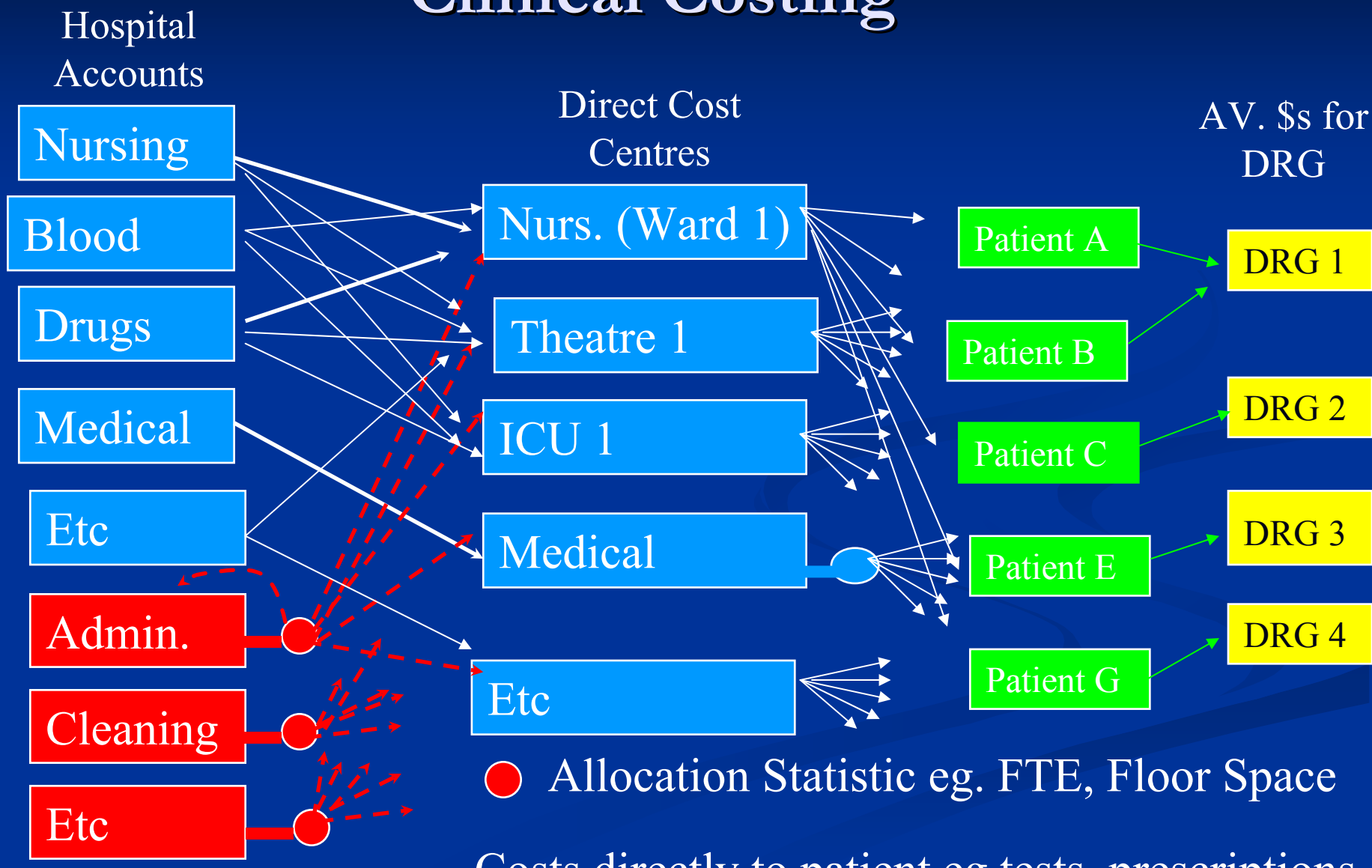


Data Requirements for Clinical Costing

- Patient level data allocated to DRG
  - Time spent in each part of the hospital
- Allocation statistics eg
  - Staff numbers (for administration costs)
  - Bed days (for meals)
  - Floor space (for cleaning)
- Cost Centre Accounting
- Detailed patient utilization data for each patient eg
  - Nursing requirements from ward rosters
  - Theatre estimated costs based upon minutes
  - Lists of drugs and when they were prescribed for each patient
  - List of diagnostic tests, when they were performed for each patient and how much each test cost (or estimate)
  - etc

The same as for Cost Modeling

Getting the Average Cost per DRG: Clinical Costing



Mixed Approach

- No Hospital use full clinical costing – all model to a greater or lesser extent (eg Doctor's salaries)
- Try to move towards clinical costing as far as possible
- Could use a normative approach for specific DRGS (especially for specific costs such as prostheses) ➔ important to be transparent *.
- * You will lose industry confidence if you are seen to "fiddle" the weights ➔ negotiate adjustments with the industry.

Data Quality – in costing studies

- Quality data requires appropriate costing processes:-
  - Cost should reconcile back to the hospital's general ledger.
  - Accounting standards and costing standards should be in place and used (not yet done in Victoria after 13 years of hospital costing, although getting closer)
  - Comprehensive clinical/industry review of the data before its use for constructing weights.
  - Revenue needs to be treated consistently.
- At least initially audit/review both the data and the costing process.

BUT !

NO DATA

OR

INSUFFICIENT DATA (too few cases for confidence)

Dangers in using foreign weights

- Funding is much more sensitive to weights than classification:
  - An unbiased estimate for a heterogeneous group can still give reasonable result, but
  - A biased estimate will give inappropriate results no matter how good the classification or coding.
- Foreign weights can give biased results because of:-
  - Differences in clinical practice
  - Differences in epidemiology
  - Differences in underlying cost structure (eg. awards)
  - Differences in the types of costs incurred by hospitals
  - Differences in policy relating to the scope of casemix

An example in using foreign weights

When New Zealand first adopted casemix they used Victorian weights published on the internet. Significant funding issues occurred including:-

- Many DRGs had significantly different length-of-stay profiles in the two countries
- Renal Services were under funded because the Victorian weight was augmented by a capitation grant.
- Surgery and blood DRGs were under funded because Australian hospitals receive blood at no cost. Similarly many drug costs in Australia are very low because of the Australian Government's position as a monopsony.
- Weights for various short stay procedures (eg scopes) fluctuated by ±30% as New Zealand excluded groups of short stay patients from casemix.

Irish Cost Weight Project

- Steve Gillett, Brian Donovan, Claude Greally, Michael Rains, Donal Keirnan
- PCSE Budapest 29 October 2004
- Modeling foreign costs on local data
- Used this year in Ireland's funding formula.
- Study to be repeated in November for next year

The Method

SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT

PART 2

APPLYING THE MODEL TO IRISH MORBIDITY DATA

PART 1

BUILDING THE COST MODEL USING AVAILABLE DATA FROM VICTORIA & NEW ZEALAND

PART 3

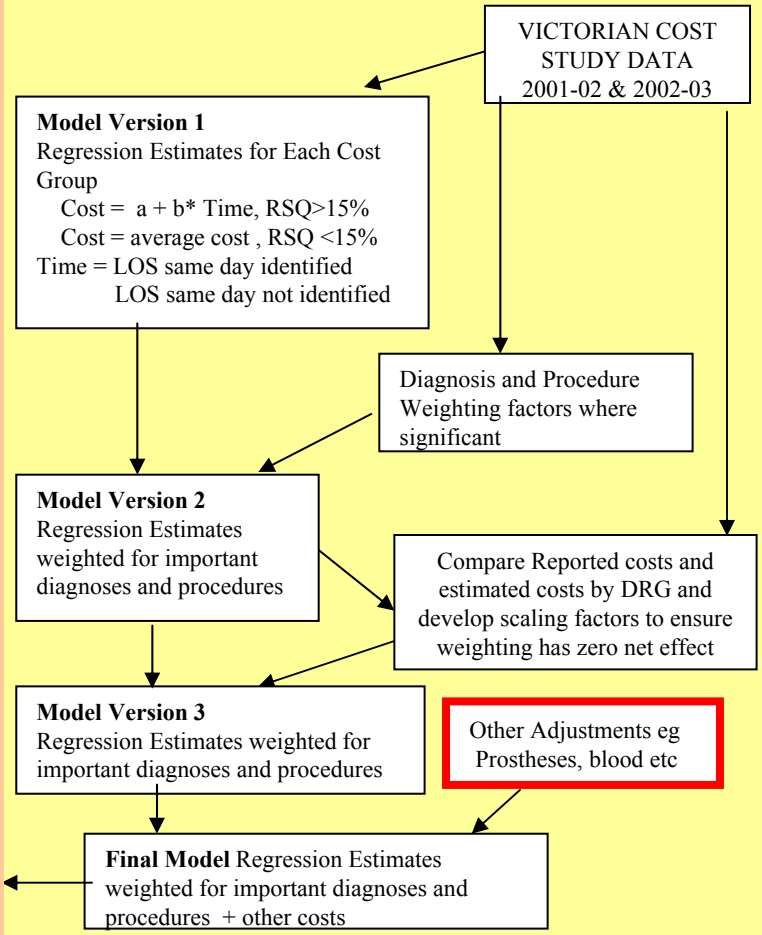
DEVELOPING ARDRG50 COST WEIGHTS

The Method Part 1

SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT

PART 2

APPLYING THE MODEL TO IRISH MORBIDITY DATA



PART 3

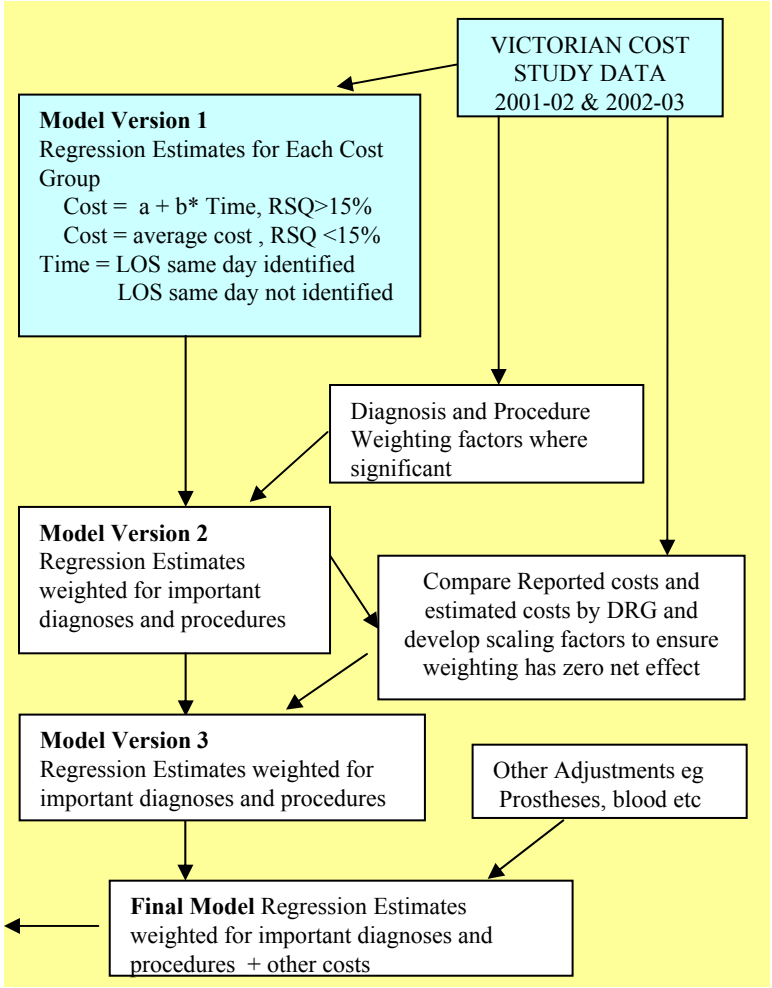
DEVELOPING ARDRG50 COST WEIGHTS

SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT

The Method Part 1a

VICTORIAN COST STUDY DATA 2001-02 &2002-03

Model Version 1
Regression Estimates for Each Cost Category
Cost = a + b* Time, RSQ>15%
Cost = average cost , RSQ <15%
Time = LOS same day identified
LOS same day not identified



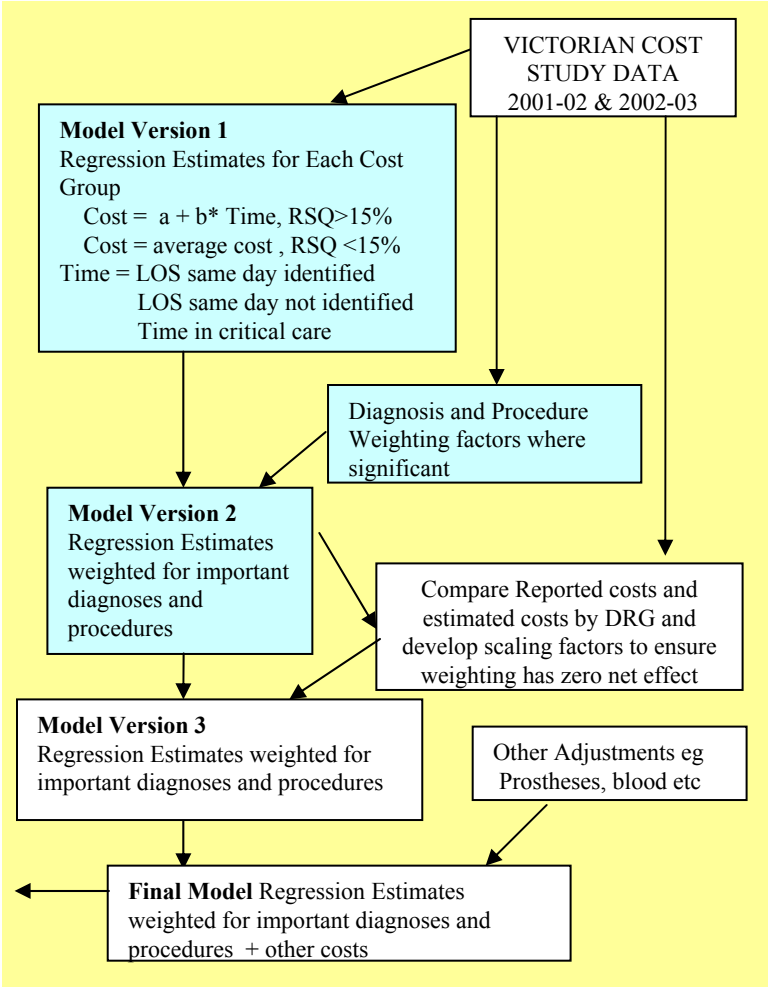
SCHEMATIC DIAGRAM FOR Irish ARDRG5.0 COST WEIGHT PROJECT

The Method Part 1b

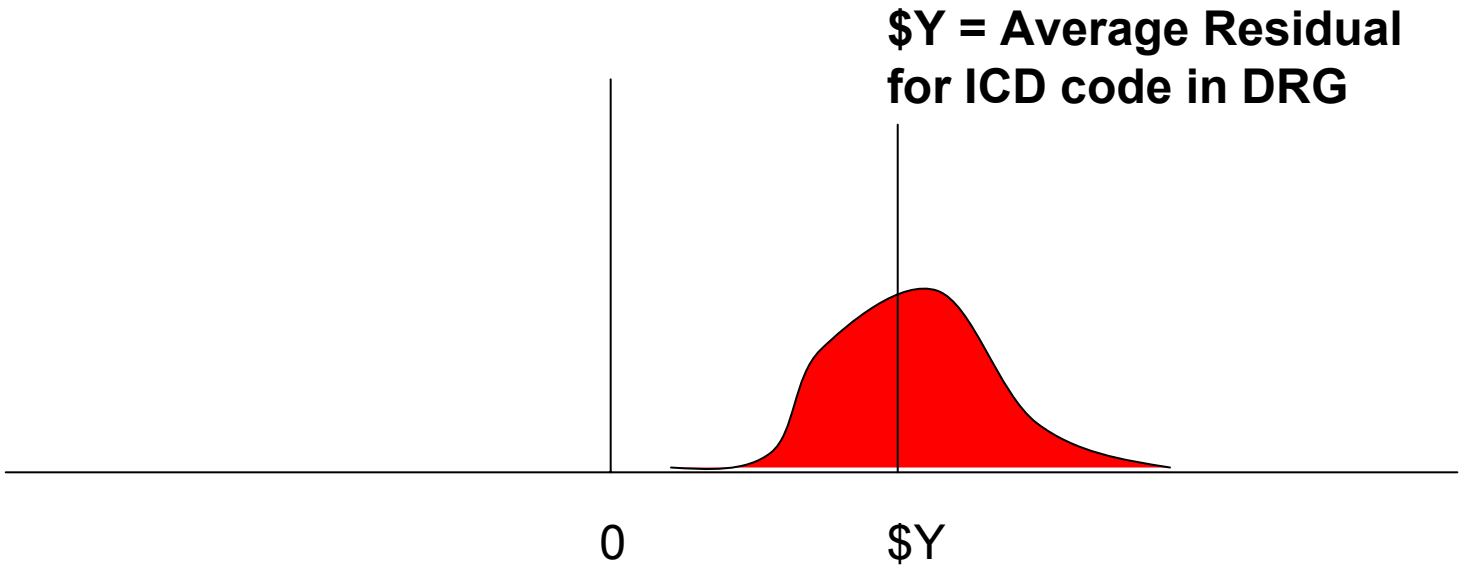
Model Version 1
Regression Estimates

Diagnosis and Procedure Weighting factors where significant

Model Version 2
Regression Estimates weighted for important diagnoses and procedures



Diagnosis and Procedure Weighting Factors



ICD weighting factor = 1 if Y is not significantly (P=0.05) different from 1

= 1 + ($Y / $Average estimated for DRG)

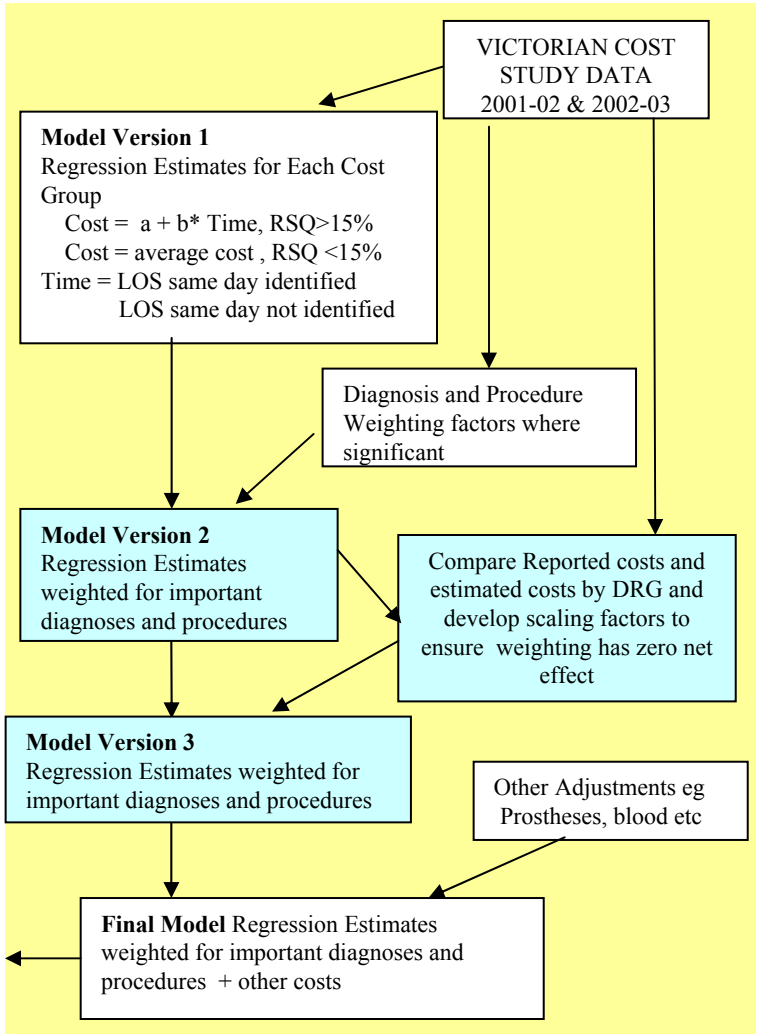
SCHEMATIC DIAGRAM FOR IRSH ARDRG5.0 COST WEIGHT PROJECT

The Method Part 1c

Model Version 2
Regression Estimates with Pdx and Ppx factors

Compare Reported costs and estimated costs by DRG and develop scaling factors to ensure weighting has zero net effect

Model Version 3
Regression Estimates weighted for important diagnoses and procedures



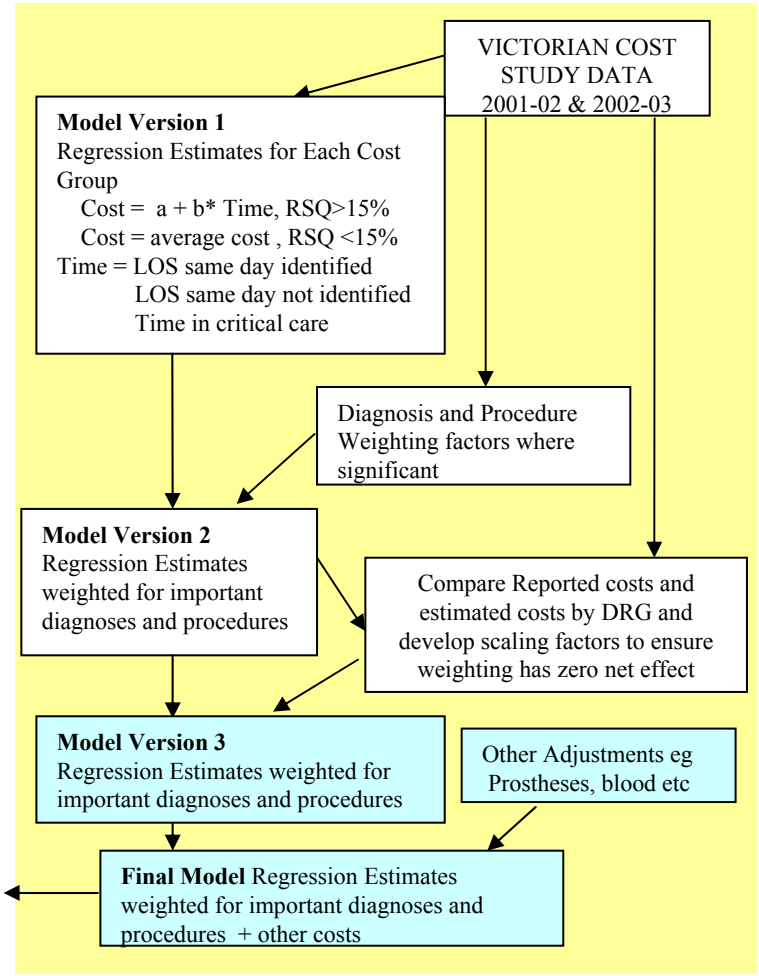
SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT

The Method Part 1d

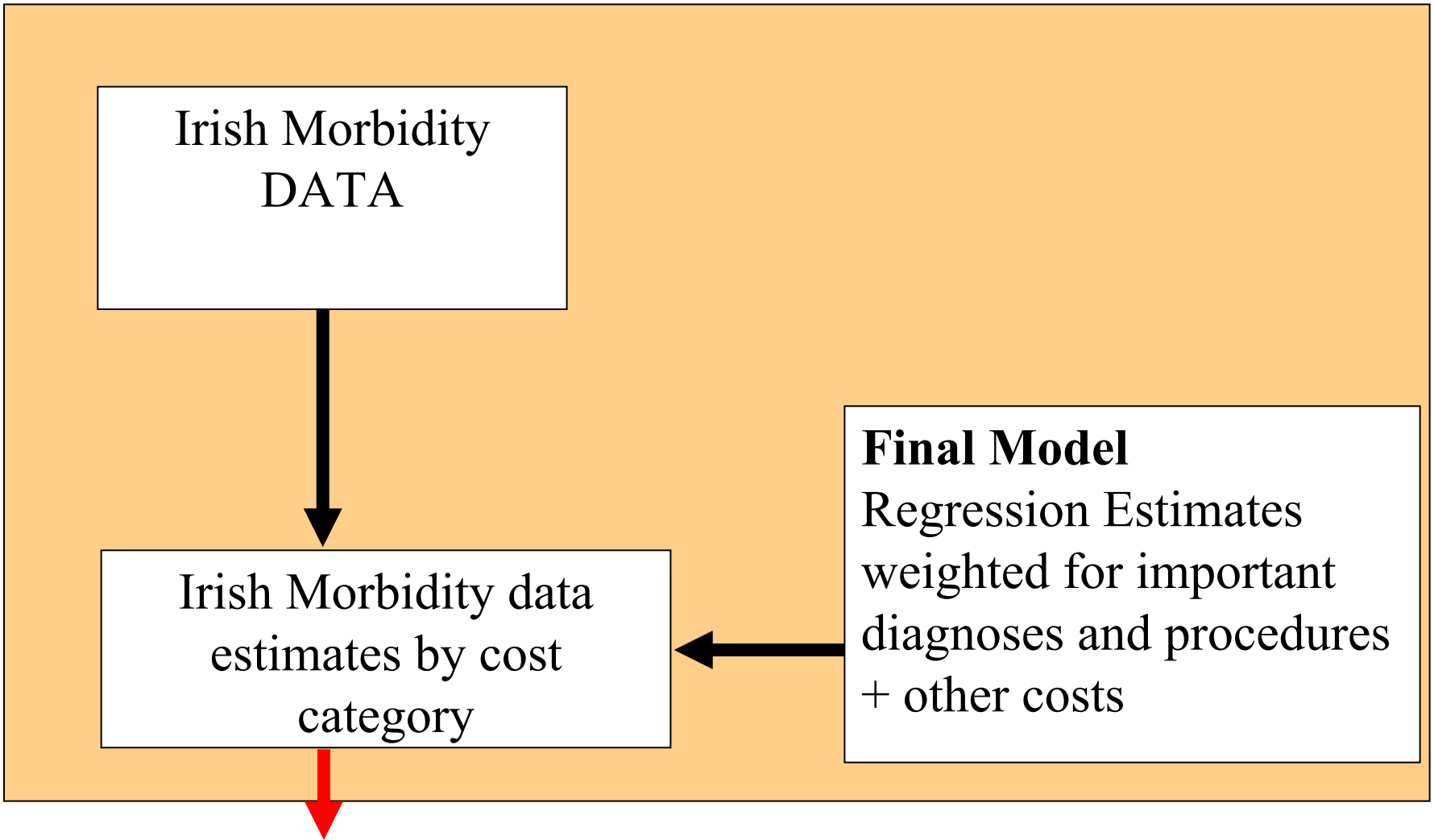
Model Version 3
Regression Estimates weighted for important Pdx and Ppx

Other Adjustments eg Prostheses, blood etc

Final Model Regression Estimates weighted for important diagnoses and procedures + other costs

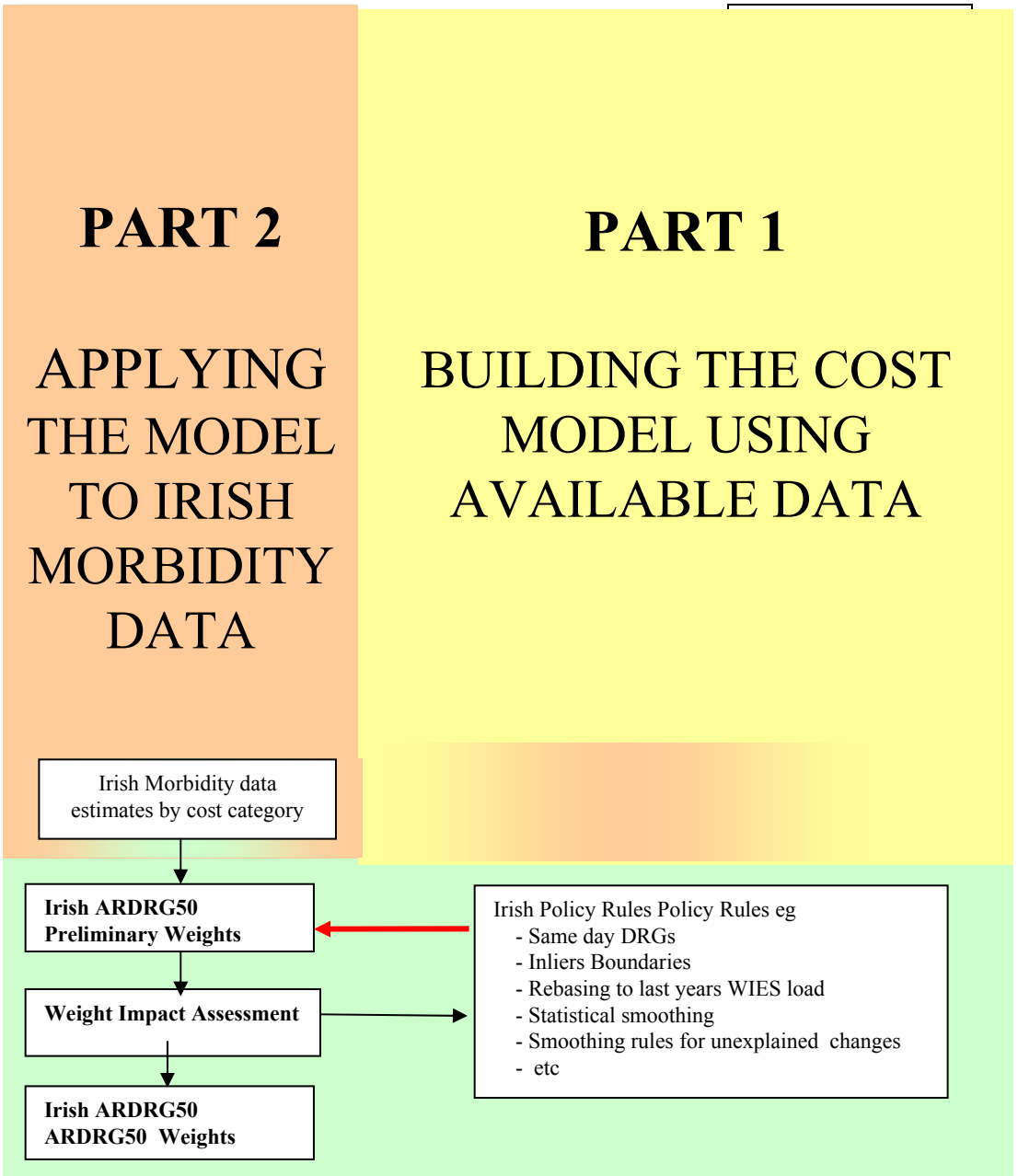


The Method Part 2a



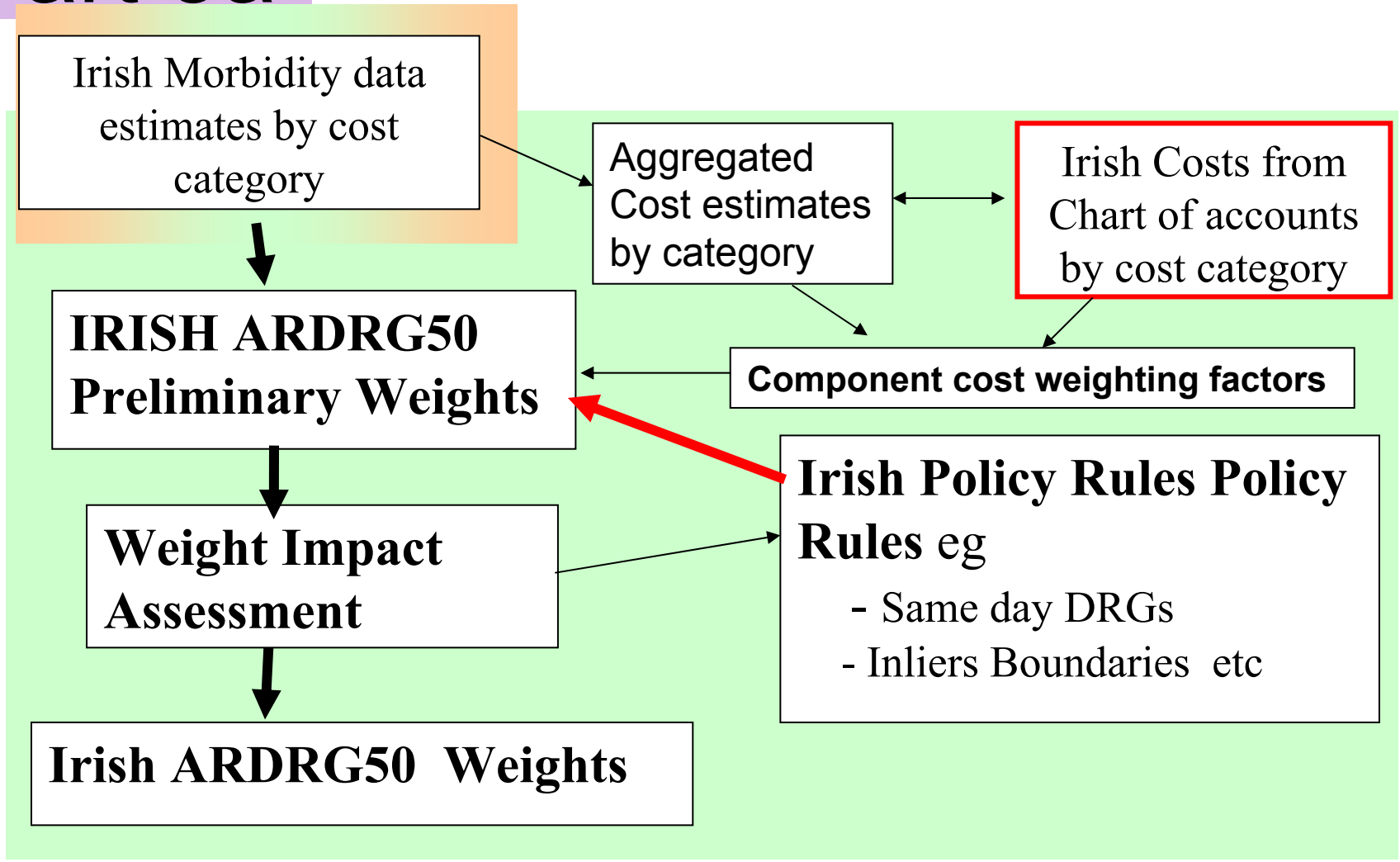
The Method Part 3

SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT



The Method Part 3a

SCHEMATIC DIAGRAM FOR IRISH ARDRG5.0 COST WEIGHT PROJECT



Outcome

- Weights that are:-
  - Adjust for known issues in Australian cost data
  - Adjust for length of stay differences between countries
  - Adjust for differences in the types of patients in each DRG.
  - Adjusted for the relative costs of each cost component
  - Adjust for local policy differences

Other Issues

- **Timing** – typically cost data are almost 2 years old before they are available for calculating weights:
  - Clinical practice and costs can change rapidly
  - Sometimes need to use qualitative information to set weights using a normative approach.
- **Perspectives**
  - Hospital perspectives - Hospital executives tend to consider absolute losses worse than large percentage losses (ie. it is worse to lose $50,000 on one patient than $500 on a thousand patients). This can disadvantage the sickest patients.
  - Political perspectives – the community sometimes places higher value on some services (eg. those to children or those to disadvantaged groups) than to others.
  - Such factors sometimes result in preferential weighting (eg. scaling weights up by 30%). If this is done transparency should be maintained by clearly identifying the size and reasons for scaling.

Other Issues 2

- **Different weights** – it is sometimes argued that different groups of hospitals require different weights (eg. teaching hospitals, paediatric hospitals, rural hospitals etc)
  - There is no consensus but the general weight of opinion in Australia supports use of a single set of weights with differing unit prices.
  - There is often insufficient data to construct multiple sets of weights.
- **Quality/Best practice** – empirically derived weights are based upon average practice. It is sometimes advocated that a normative approach should be used to facilitate best practice.

Other Issues 3

- **Economies of size** – in some DRGs a single provider can dominate the cost data. If that hospital is able to negotiate substantial discounts on supplies (eg. prostheses) other hospitals are effectively unable to provide the service without loss. This can impact on access for some patients.
  - Consider setting weight based upon median hospital cost.

Thank You

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Other Slides

Obtaining Cost Weights

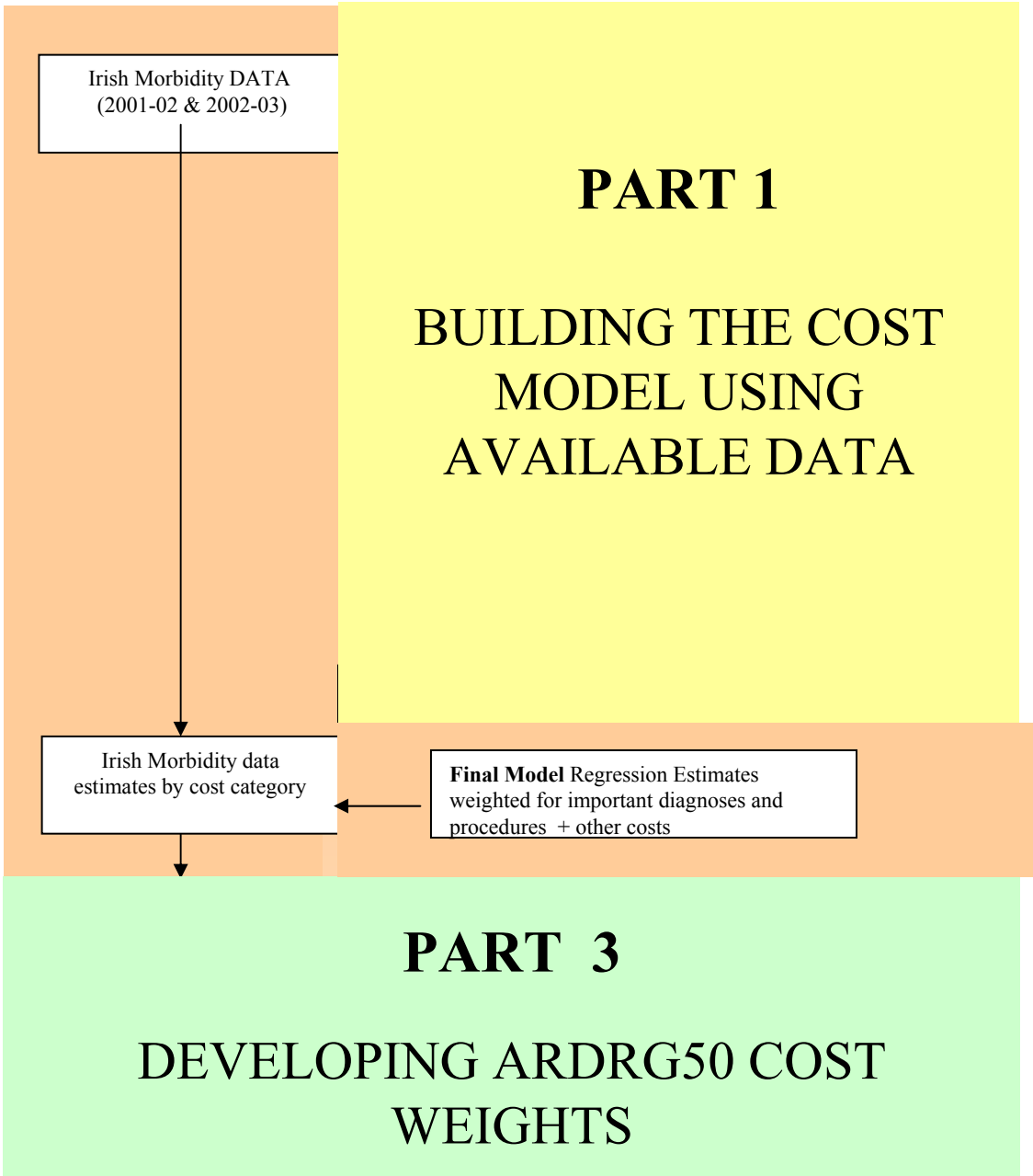
- Different approaches have been used
  - Running clinical costing software that allocates costs to each patient/day
  - Running patient costing software in local hospitals
  - Running cost modelling for local hospitals:
    - using local service weights
    - using foreign service weights
  - Modelling foreign costs onto local data
  - Adjusting foreign weights for known issues
  - Using foreign weights

Least desirable/
Most problematic

Most desirable/
Least problematic

SCHEMATIC DIAGRAM FOR Irish ARDRG5.0 COST WEIGHT PROJECT

The Method Part 2



How well do the regression estimates explain costs (R-squares)

• Nursing	71%
• Imaging	38%
• Allied Health	47%
• Pharmacy	28%
• Medical	54%
• Critical care (ICU+CCU)	63%
• Emergency	25%
• Pathology	52%
• Theatre	56%
• Combined Components	78%
• Total estimated	81%

Preliminary Weighting Factors (under revision)

Component Cost	Modelled on Irish HIPE	Actual from Hospital Returns	Component Cost Weighting Factors
Nursing Ward	44.0%	38.3%	86.9%
Medical	17.3%	18.2%	104.9%
Critical Care	3.7%	5.0%	137.4%
Emergency Department	4.7%	3.2%	66.9%
Theatre + Prosthesis	14.9%	17.6%	118.0%
Allied Health	2.3%	1.0%	41.4%
Imaging	3.1%	2.6%	84.3%
Pathology	3.3%	5.2%	156.8%
Pharmacy	4.7%	6.9%	146.0%
Blood	1.2%	2.1%	175.1%
Other	0.9%	0.0%	0.0%