# Burden in Thalassaemia: Economic Aspect

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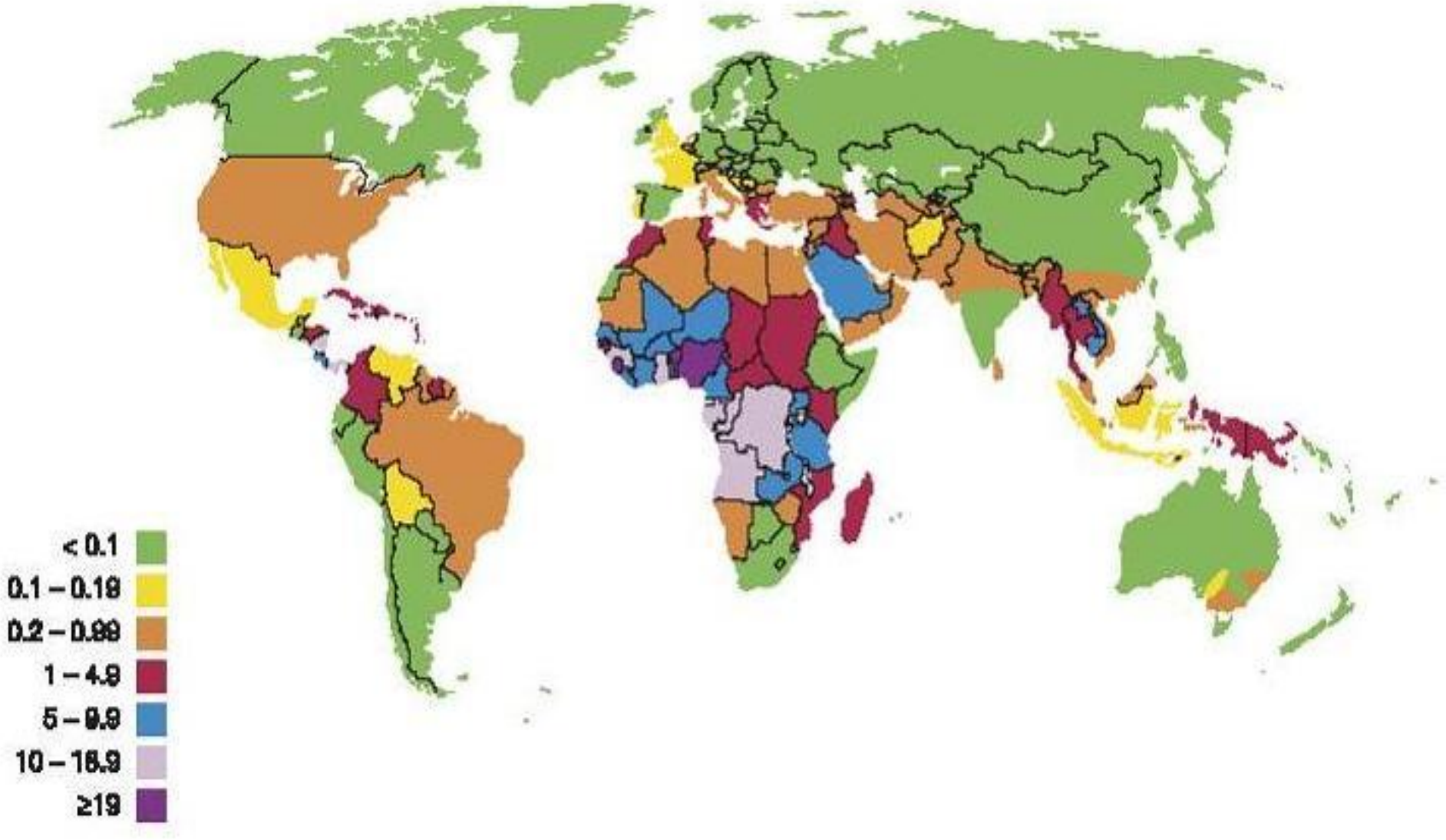
# Births with a Pathological Haemoglobin Disorders per 1,000 live births

## Global Distribution of Pathological Haemoglobin Disorders 1996 (WHO)




Source: March of Dimes/Global report on Birth Defects-The hidden toll of dying and disabled children

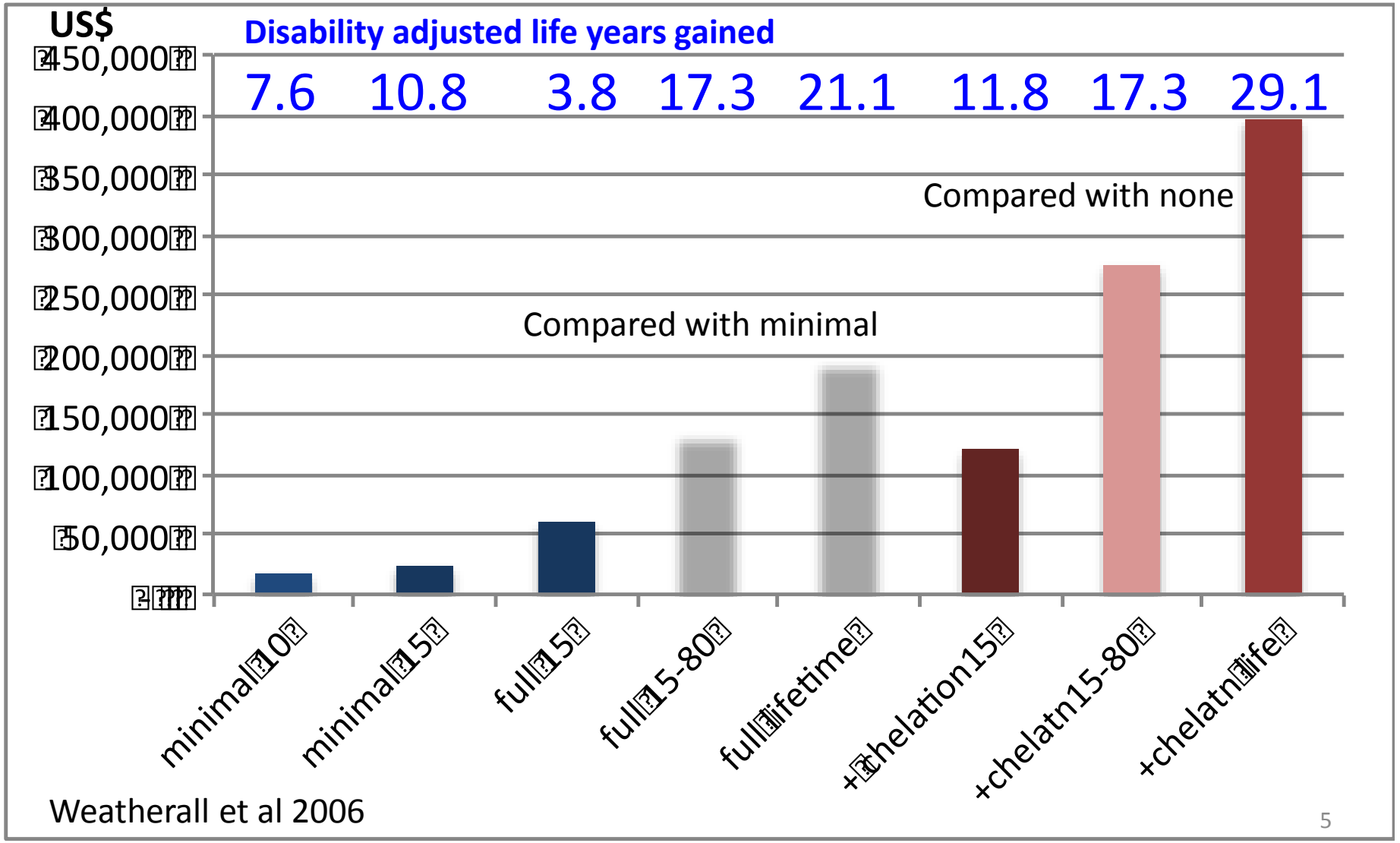
# Control programme/activities

| Policy/service | Malaysia | Indonesia | Singapore | Thailand |
|---|---|---|---|---|
| National policy | Yes | Yes | Yes | Yes |
| Patient registry | Hospital based | Yes | Yes | Hospital based |
| Chelating agents registered | All | All | All | All |
| Chelation free | Yes | Yes | Yes | Partial support |
| Specialist monitoring (e.g. cardiac MRI) | Yes | In major centres | Yes | Yes |
| National Screening program | yes | no | Yes | Yes |

# Epidemiology in ASEAN (TIF 2013)

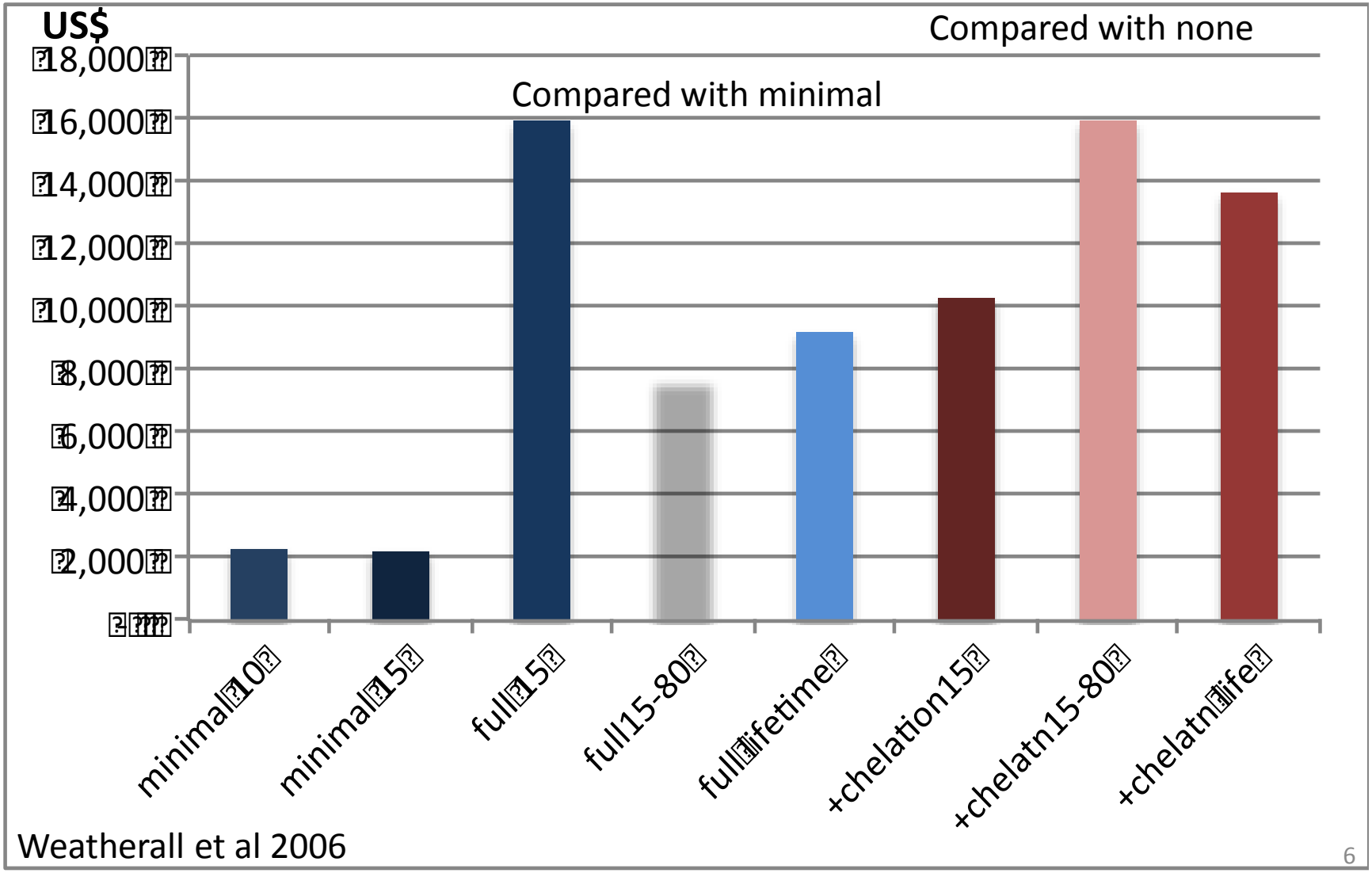
| Country | a- thal carriers | ß-thal carriers | HbE carriers | Annual expected births | Known patients treated |
|---|---|---|---|---|---|
| Brunei Darussalam | ? | 2% | ? | 1 | 179 |
| Cambodia | 35% | 3% | 35% | 1762 | ? |
| Laos | 42% | 6% | 18% | 1106 | ? |
| Malaysia | 23% | 4.5% | 3.4% | 727 | 1500 |
| Myanmar | 30% | 2.2% | 22% | 2398 | 4079 |
| Indonesia | 0.5% - 11% | 5% | 6% (1-33%) | 9368 | 5431 |
| Philippines | 7% | 1.2% | 0.4% | 153 | 600 |
| Singapore | 4% | 3% | 0.64% | 13 | 154 |
| Thailand | 30% | 5% | 30% | 6983 | 400000 |
| Vietnam | 5% | 2% | 1% | 830 | 1000 |
| Total | ~20% | ~3.5% | 1-30% | ~23000 | ~413000 |

# Cost $/person and DALYs gained




Weatherall et al 2006

# Cost ($) per DALY gained




Weatherall et al 2006

# Cost of illness approach in Thailand

- Transfusion dependent cases (Severe cases 47%)
- OP visits 9.2/person/yr (Severe 10.4, non 8.3)
- IP 10.9% per yr (Severe 17.0, non-severe 5.7%)
- Bl Tx 7.4 times/yr (Severe 9.4, non-severe 5.7)
- Chelation 44% (Severe 59%, non-severe 32%)
- Total cost $950 (95%CI 806-1,293)/person/year
  - Severe cases $1,023, non-severe $889
  - Direct med cost 59%; Direct non-med 17%, Indirect cost 24%

Riewpaiboon et al 2012

# Cost Utility Analysis in Thailand

- Haematopoietic stem cell transplantation (HSCT) vs. blood transfusion with iron chelating therapy (BT-ICT): the incremental cost-effectiveness ratio (ICER)
  - B80,700 - 183,000/QALY gained for related HSCT
  - B209,000 - 953,000/QALY gained for unrelated HSCT among patients aged 1 to 15 years
- Providing 200 related HSCT to patients aged 1 to 10 years, approx B90 million/year in addition.

Leelahavarong et al 2010

# Claim data at NHSO in 2014

- 53,189 antenatal investigations from 31,492 pregnancies; except NHSO Bangkok branch
- 8% missed father investigations
- Tests claimed (mother vs. father):
  - Hb typing 71% vs. 67%
  - PCR 22% vs. 21%
  - Mutation analysis 2% vs. 2%
  - Cordocentesis, amniocentesis, CVS 2%

Acknowledge – National Health Security Office

# Test results and prenatal diagnosis

| | Father | |
|---|---|---|
| Mother | F normal | F abnormal |
| M normal | 26% | 14% |
| M abnormal | 15% | 44% |

From 45,766 paired tests

Cordocentesis, amniocentesis, CVS only 2%

# Claim data at NHSO in 2014 by region

| Region | N | Hb typing | PCR | Mutation | PND | Missed F |
|---|---|---|---|---|---|---|
| 1 | 6,307 | 51% | 32% | 2% | 604 | 15% |
| 2 | 4,231 | 61% | 28% | 1% | 78 | 5% |
| 3 | 4,240 | 60% | 31% | 1% | 93 | 5% |
| 4 | 2,006 | 74% | 9% | 0% | 23 | 15% |
| 5 | 2,351 | 78% | 15% | 0% | 11 | 6% |
| 6 | 1,604 | 80% | 13% | 0% | 9 | 5% |
| 7 | 4,658 | 74% | 13% | 0% | 33 | 5% |
| 8 | 6,653 | 76% | 18% | 3% | - | 2% |
| 9 | 6,125 | 61% | 15% | 0% | 12 | 13% |
| 10 | 10,074 | 73% | 20% | 0% | 1 | 4% |
| 11 | 2,154 | 52% | 10% | 1% | 43 | 35% |
| 12 | 2,786 | 39% | 6% | 0% | 19 | 45% |
| Sum | 53,189 | 65% | 20% | 1% | 926 | 10% |

# Inpatient cases in 2009

From 5.9 admissions:

0.8% Thalassaemia as principal diagnosis (PDx)

0.3% by inpatient hospital resource use (RW)

0.2% by lengths of stay

| Pre MDC | | CSBMS | UC | UC Uhosnet |
|---|---|---|---|---|
| | Cases of BMT | 5 | 0 | 0 |
| 15 | Childhood cases | 0 | 19 | 2 |
| 16 | Haematological | 96.2% | 94.2% | 93.1% |
| 26 | Ungroupable | 0.6% | 0.2% | 0% |
| 28 | Short stay<6 hrs | 3.0% | 5.5% | 6.8% |
| | Total cases | 2,696 | 41,535 | 1,940 |

# Casemix Index of Thalassaemia cases

| MDC | All cases RW | *RW Thal/All |
|---|---|---|
| 15 Childhood diseases | 0.5493 | 1.4 |
| 16 Haematological | 0.6372 | 0.6 |
| 26 Ungroupable | 0.8563 | 0.7 |
| 28 Short stay | 0.3074 | 0.5 |

* Average CMI of UC cases to all cases

# Conclusions

- Opportunity to improve data quality for assessing economic burden
- Burden that could be averted from screening was still under targeted
- Newborns with thalassaemia were still low with higher severity
- Cost-effective treatments available but low utilised
- Inequity of economic burden to the worst off
- Redesign service plan and financing mechanisms.

# Acknowledgements


- National Health Security Office
- Central Office for Healthcare Information
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