Estimating Child Death from Perinatal Originating Conditions and Congenital Malformations in Thailand based on the 2005 Verbal Autopsy Study

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Outline of the presentation

• Background and Rationale
• The 2005 Verbal Autopsy Study
• Path diagram
• Logistic regression model
• Results
• Conclusion
• The deaths caused by condition originating in the perinatal periods and congenital malformations are mainly related to pregnancy, labor and delivery.

• preventable and manageable by proper prenatal-antenatal care and safe delivery related programs.

• These conditions are listed as chapter 16 and 17 in the chapter block classification of the ICD-10. (http://www.icd10data.com/ICD10CM/Codes/P00-P96)
• Under 5 mortality declined significantly but little progress in reducing neonatal mortality.

• Neonatal death mainly caused by the condition originating in perinatal period

• About 40% of death certificates in Thailand give the cause of death as "ill-defined", which severely limits their public utility.

• Therefore this study aimed to estimate the deaths caused by two above mentioned conditions based on 2005 Verbal Autopsy(VA) in Thailand.
A VA study, carried out in 2005 assessed the cause of death from a sample of 9644 from 28 selected districts in 9 provinces, giving a data table with 5 fields:

(a) the deceased person’s province: the 9 provinces sample sizes shown in the map;
(b) the person’s gender and age;
(c) the ICD-10 code reported on the death certificate;
(d) the location of death (in hospital or outside hospital);
(e) the VA-assessed ICD-10 code.
## Under 5 Deaths in VA Study

<table>
<thead>
<tr>
<th>Cause group</th>
<th>0-4 years</th>
<th>5+ years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal (ICD-10 block P)</td>
<td>59</td>
<td>0</td>
<td>59</td>
</tr>
<tr>
<td>Congenital (ICD-10 block Q)</td>
<td>38</td>
<td>16</td>
<td>54</td>
</tr>
<tr>
<td>Other causes</td>
<td>52</td>
<td>9479</td>
<td>9531</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>149</strong></td>
<td><strong>9495</strong></td>
<td><strong>9644</strong></td>
</tr>
</tbody>
</table>
Target population: All reported Thai deaths of under 5 yrs, Jan 1996-Dec 2009.

Sample: subset of under 5 yrs (149) out of total VA sample (9964) assessing true cause of death from selected residents of 9 provinces in Thailand who died in 2005.

Path diagram for analyzing deaths among < 5 children

Determinants

(a) province
(b) gender
(c) reported ICD-10 cause group
(d) location (in/outside hospital?)

Outcomes

Death by perinatal originating condition, congenital and Other causes
This model formulates the logit of the probability $P$ that a person died from the selected cause as an additive linear function of the three determinant factors as follows:

\[
\text{logit}(P) = \log(P) - \log(1 - P) = \text{constant} + \text{factor(province : 9 levels)}
\]

\[
+ \text{factor(gender : 2 levels)}
\]

\[
+ \text{factor(VR cause-location : 4 levels)}
\]

Logistic regression model
Preliminary Results

VR group

1: perinatal
2: congenital
3: other

VA group

1
2
3

total

59
38
52

149

40
3
4

47

16
14
46

26

76
### P-values based on Logistic Regression Model

<table>
<thead>
<tr>
<th>Study factor</th>
<th>Perinatal</th>
<th>Congenital</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province</td>
<td>0.978</td>
<td>0.936</td>
<td>0.774</td>
</tr>
<tr>
<td>Sex</td>
<td>0.238</td>
<td>0.704</td>
<td>0.515</td>
</tr>
<tr>
<td>VR cause</td>
<td>&lt;0.00001</td>
<td>&lt;0.00001</td>
<td>&lt;0.00001</td>
</tr>
</tbody>
</table>
Extending to the target population

Child deaths

Male

Female

Perinatal
Congenital
Other
UnderEst

VA-estimated
reported

11
Conclusions

The study found:
• no any difference in the probability of dying by sex and province.
• significant difference in reporting the correct cause of death in and outside the hospital deaths.
• total number of estimated deaths from perinatal originating conditions (36838) is 1.49 times higher and from congenital malformation (26806) is 2.18 times higher than the reported from respective cause groups (24770 and 12277). But deaths from other causes were over reported.
Acknowledgements

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• all my family, friends and well wishers.
Thank you for your attention!!

Any Comments and Suggestion ??