EE602

Cost-Effectiveness of Universal Screening for Hypothyroidism in Pregnant Women in Indonesia and Mexico

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CONCLUSIONS

In emerging markets such as Indonesia and Mexico, universal screening is cost saving vs high-risk and no screening under public sector funding, resulting in lower costs, fewer expected events and higher quality-adjusted life years.

Policymakers are encouraged to integrate universal screening protocols into maternal healthcare for improved health outcomes and cost savings in these countries.

Hypothyroidism Universal Screening Impact per 10,000 pregnant women

Events avoided:
Indonesia: between 607 and 382
Mexico: between 156 and 36

QALYs gained:
Indonesia: between 188 and 123
Mexico: between 118 and 46

Cost savings over pregnancy period:
Indonesia: between 170,000 and 95,000 EUR
Mexico: between 74,000 and 3,000 EUR

4.9 M and 2.1 M pregnancies annually in Indonesia and Mexico respectively, corresponding to **84 M EUR** and **16 M EUR** in cost savings vs no screening

INTRODUCTION

- Hypothyroidism is a prevalent health concern in developing countries like Indonesia, Mexico, and worldwide.
- Untreated hypothyroid disease during pregnancy can lead to serious health problems for mother and child, with consequential increase in health care costs.
- Implementing cost-effective screening and intervention strategies in the pregnant population is essential to mitigate the associated costs of untreated hypothyroidism and improve maternal and fetal outcomes.

OBJECTIVES

- Assess the cost-effectiveness of universal hypothyroidism screening versus high-risk screening and no screening.
- Inform healthcare policies and decision-making processes regarding the most efficient approach to hypothyroidism screening during pregnancy in Indonesia and Mexico.

METHODS

A decision-analytic model assessed costs and outcomes (miscarriages, preterm births, QALYs) using screening data from local databases where possible (e.g. Indonesian registry on pregnant women and hypothyroidism[1]), observational studies[2,3] and previous relevant publication[4,5].

The analysis considered a within-pregnancy horizon and the perspective of the local healthcare system, assuming 100% public funding as base case.

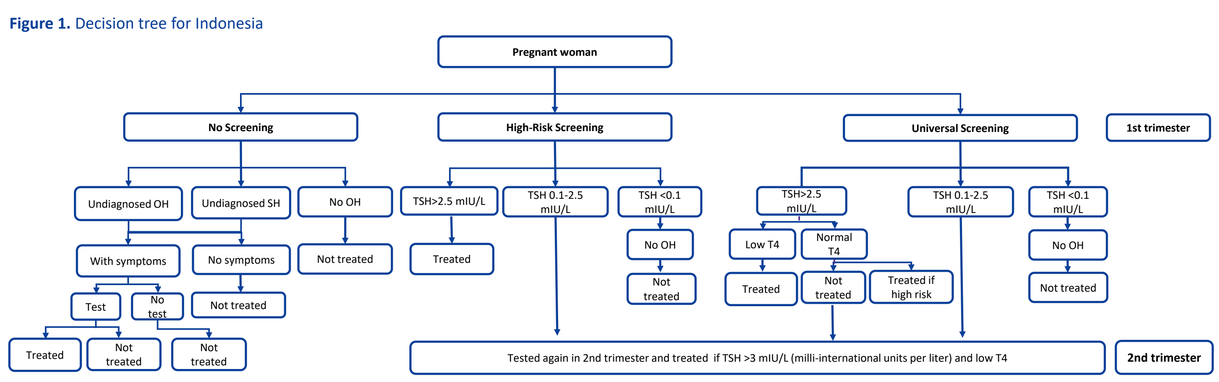
The model structure is presented for Indonesia (figure 1). For Mexico, it was updated to take into consideration the lack of local data on number of pregnant women with different TSH levels.

Scenario analyses tested the impact of relevant local policies like different private shares in both countries.

- Because stunting is an important public health concern in Indonesia, a scenario analysis explored number of stunting cases under alternative screening strategies.
- For Mexico, scenario analyses explored 100% of the diagnosis happening in the 1st trimester, SH pregnant women treated during pregnancy also when not high-risk and a combination of these two.

Local clinical experts validated the model assumptions, and one way sensitivity analysis (OWSA) identified key drivers of the results.

Figure 1. Decision tree for Indonesia



Base case assumptions and data

- Testing was assumed in 1st and 2nd trimesters for Indonesia and in the 3rd trimester for Mexico as per current practice.
- Thyroid-stimulating hormone (TSH) threshold levels are taken from the American Thyroid Association Guidelines 2011[6].
- Treatment was initiated for TSH >2.5 mIU/L and low T4. Normal T4 women with TSH >2.5 mIU/L started treatment if they were at high risk (previous miscarriage, infertility).
- Unscreened women could undergo symptom-related testing.

RESULTS

- Base case results assuming 100% public funding in both countries show that universal screening for hypothyroidism dominates no screening and high-risk screening as it is associated with less costs, less expected events (miscarriages, preterm deliveries, stunting), and higher QALYs (table 1).
- **Scenario analyses for Indonesia:**
  - The incremental cost-effectiveness ratio of universal screening vs high risk screening showed that for any private funding < 35% universal screening was cost-saving. When private funding increased above 35% (up to 100%), it was cost-effective (ICER well below Indonesian GDP/capita) (figure 2).
  - Assuming stunting is associated with pre-term deliveries[7], then universal screening can potentially reduce the number of children with stunting by >20% in comparison to high-risk screening, with significant long-term societal benefits and savings (table 2).
- **Scenario analysis for Mexico:**
  - The threshold of private funding was 20%, at which point universal screening stops being cost-saving and starts being cost-effective vs high-risk screening.
  - When combining 100% screening in the first trimester and treating all SH women independent of their personal risk profile, universal screening was again the dominating strategy and potentially reduce the number of outcomes (preterm deliveries, miscarriages) by 32% versus no screening and 22.5% versus high-risk screening (table 2). The introduction of 1st trimester screening can help reducing significantly miscarriages.
- Results are most sensitive to changes in utility and costs for screening.
- These results can be considered conservative as they do not include additional life-time costs associated with reducing the number of pre-term delivery and discovering hypothyroidism during pregnancy.

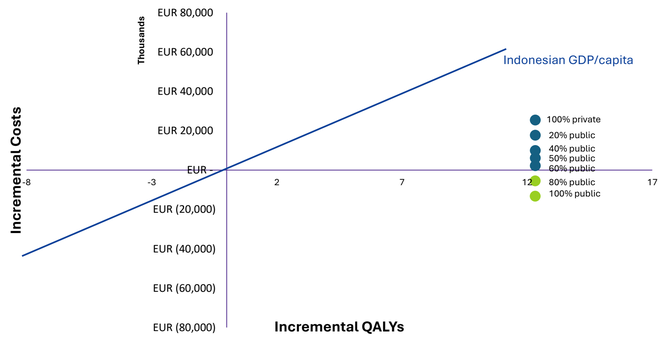
Table 1. Base Case results for 10,000 women for Indonesia and Mexico (100% public funding)

	No Screening	High-Risk Screening	Universal Screening
Indonesia			
Total costs	**EUR 1,030,752**	**EUR 956,265**	**EUR 860,796**
Total expected events	1,863	1,638	1,256
Total expected QALYs	7,161	7,226	7,349
Mexico			
Total costs	**EUR 1,560,482**	**EUR 1,489,810**	**EUR 1,486,716**
Total expected events	1,384	1,264	1,228
Total expected QALYs	7,193	7,265	7,311

Table 2. Scenario analysis results on total expected events per 10,000 women

	No Screening	High-Risk Screening	Universal Screening
Indonesia			
Stunting	305	271	211
Mexico			
100% screened in 1st trimester	1,328	1,117	1,033
Treating also SH women	1,304	1,219	1,130
Combined scenarios	1,290	1,063	823

Figure 2. Universal versus high-risk screening: Cost-effectiveness plane with ICERs for different funding scenarios in Indonesia



Abbreviations: **OH,** Overt hypothyroidism, **SH,** Subclinical hypothyroidism

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