Integrated mobile phone application to support the three pillars of End Tuberculosis Strategy: a new approachment before 2030

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BACKGROUND
Tuberculosis (TB) prevalence in Indonesia showed no significant declining since 2007 with only 44.4 % TB patients being treated.

AIM
To review the benefit and applicability of mobile phone application to support the three pillars end TB strategy, especially in Indonesia

METHODS
Narrative literature review

RESULTS

A. First Pillar of End TB Strategy: Integrated Patient Centered Care and Prevention

<table>
<thead>
<tr>
<th>Problems</th>
<th>Solutions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Patient engagement to meet drug supervision</td>
<td>Video-Directed</td>
<td>Visit One, VDOT in Kenya and New York Medlink</td>
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<tr>
<td>2. Forget to take the drug</td>
<td>Observation Therapy, Digital Adherence Technology, Reminder, Drug Package Sensor</td>
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<td>3. Late to be diagnosed</td>
<td>Online Case report system, Online surveillance, GPS-contact detection</td>
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<td>4. MDR-TB late detection and treatment</td>
<td>Improving empiric therapy data based on epidemiological study and live mapping</td>
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<td>5. Lack of information about health care facilities and support diagnosing test, especially in rural areas</td>
<td>Facilities mapping, AI-based suggestion and comparison</td>
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<td>6. Poor patient feedback system</td>
<td>Integrated online feedback to various health care facilities and provider</td>
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B. Second Pillar of End TB Strategy: Bold Policy and Supportive System

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<td>1. Unsustainable training and supervision of the cadre</td>
<td>Trainings to society adjusted by education and age to support online case system, Massive online campaign</td>
<td></td>
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<td>2. Lack of community sharing responsibility</td>
<td>WHA-nawal in Indonesia, MyTBMap, Ibtisak, SeSahabatALK, etc.</td>
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<td>3. Vulnerability of the patients, especially related to mental health, underestimation, and economic collapses</td>
<td>Experts teleconsultation, AI to help deciding the necessity of cash transfer, Rilly, (PjorRokologi), BetterGym, (Nutrimet), Pacific Nutrition, Opportunity NYC, Grow560</td>
<td></td>
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<td>4. Unclear policy related to universal health coverage</td>
<td>Mobile financial transaction and investment with AI decision support, Mostly among e-commerce and forex trading</td>
<td></td>
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<td>5. Limited support for patients and families due to the stigma and discrimination</td>
<td>Online peer support, Increasing awareness, Pasienca, Healthier.id, Alodokter</td>
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C. Research Opportunities to Support Third Pillar of End TB Strategy

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Example</th>
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<tbody>
<tr>
<td>Epidemiology</td>
<td>Epidemiological Alert System in Fall</td>
</tr>
<tr>
<td>Case Report</td>
<td>ESP system in USA</td>
</tr>
<tr>
<td>Health economic</td>
<td>Review the economic data provided by the app</td>
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DISCUSSION
143 million population (54.5%) in Indonesia had internet access, mostly mobile internet. This number is increasing 56 million people from 2015

In average, Indonesian spent 3.5 hours/day to surf using mobile devices

Mobile broadband price is USD 3.4 / $500 megabyte, with average connection 3.9 mbps

Digitalization improvement in Indonesia and 2016-2020

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<th>Economic class distribution</th>
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<td>High Incomes (57.7%)</td>
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<td>Low Income (20.3%)</td>
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In Indonesia, average 58% of people are using mobile devices

75% of online purchase are using mobile devices

8x rising data traffic in 2020 compared to 2015

CONCLUSIONS
Mobile phone application should be applied as integrated “one stop” concept and it is needed to attract gross participation from society to maximizing its benefit to TB

BIBLIOGRAPHY

- Separated or Integrated: Lesson from Snapchat and BBM Engagement and retention rate
- Societal disparities: Geography or emergency signal system being used?
- Age related users: children?
- Poverty: guardian?
- Government’s roles: what kind of leadership style suitable for this program?
- Private sector collaboration: to increase connectivity and technology development
- Becoming Independent developer or creating platforms for startups to join the initiation?
- Ethical consideration to use the big data provided for the researches

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