Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta

A qualitative study on the perceptions of stakeholders involved in Yayasan Orangtua Peduli’s Smart Use of Antibiotics campaign in Indonesia

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<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ABR</td>
<td>Antibiotic resistance</td>
</tr>
<tr>
<td>AMR</td>
<td>Antimicrobial resistance</td>
</tr>
<tr>
<td>DPR</td>
<td>Doctor-patient relationship</td>
</tr>
<tr>
<td>GE</td>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>IMCH</td>
<td>International Mother and Child Health</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MRSA</td>
<td>Methicillin-resistant <em>Staphylococcus aureus</em></td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organisation(s)</td>
</tr>
<tr>
<td>ORS</td>
<td>Oral Rehydration Solution</td>
</tr>
<tr>
<td>OTC</td>
<td>Over the counter</td>
</tr>
<tr>
<td>RTI</td>
<td>Respiratory Tract Infection</td>
</tr>
<tr>
<td>RUM</td>
<td>Rational use of medicine</td>
</tr>
<tr>
<td>SUA</td>
<td>Smart Use of Antibiotics</td>
</tr>
<tr>
<td>UHC</td>
<td>Universal Health Coverage</td>
</tr>
<tr>
<td>URI</td>
<td>Upper respiratory infection</td>
</tr>
<tr>
<td>URTI</td>
<td>Upper respiratory tract infection</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>YOP</td>
<td>Yayasan Orangtua Peduli / Concerned and Caring Parents Foundation</td>
</tr>
</tbody>
</table>
Glossary

A
Antibiotic resistance: the ability of certain strains of microorganisms to develop resistance to antibiotics (1).

Antimicrobial resistance (drug resistance): the ability of disease organisms to resist effects of drugs that previously were toxic to them (2).

G
Generic drug: The term "generic" can refer to various terms such as 1.) The chemical name of a drug; 2.) To the chemical makeup of a drug rather than to the advertised brand name under which the drug is sold; or 3.) To any drug marketed under its chemical name without advertising (3).

Genome: The complete set of genes in an organism (4).

H
Healthcare professional: any individual, institution, or agency that provides health services to health care consumers (2).

M
Methicillin resistant Staphylococcus aureus: Staphylococcus aureus resistant to the antibiotic methicillin (5).

P
Public-Private Partnership: Relationship between a private-sector company and a government agency for the purpose of completing a project that will serve the public (6).

R
Rational use of medicine: Patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time and at the lowest cost to them and their community (7).

U
Universal Health Coverage: Universal health coverage is defined as ensuring that all people have access to needed promotion, preventive, curative and rehabilitative health services of sufficient quality to be effective, while also ensuring that people do not suffer financial hardship when paying for these services (8).

Upper respiratory infection: An infection of the upper part of the respiratory system, which is above the lungs (9).
Abstract

Introduction: Southeast Asia has among the highest rates of antibiotic resistance worldwide, particularly in Indonesia, where paediatricians prescribed antibiotics to 94% of children, knowing that the infection was viral.

Relevance: There is a gap in understanding of the reasons behind the irrational use of antibiotics by healthcare professionals and patients.

Aim: This research aims to explore factors that influence the use of antibiotics and knowledge about antibiotic resistance in Jakarta, Indonesia.

Methods: In December 2014, the researcher conducted thirteen semi-structured interviews with four stakeholder groups, which are involved in the “Smart Use of Antibiotics” campaign in Jakarta. Qualitative Content Analysis was used to identify the theme “unite our voice to address antibiotic resistance from all angles” as well as the five categories: Education, Media, Policy, Culture and Trust.

Results: Each category presented one factor, which was divided into the sub-factors education of patients and professionals; online and offline media; policy and guidelines, drug availability and accessibility and stakeholder involvement; habit and behaviour, doctor-patient relationship, environment / surroundings; and trust in the system, in the healthcare professionals, among professionals and in medicine.

Conclusion: All stakeholders need to unite their voices together to achieve a smarter use of antibiotics and increase the knowledge about antibiotic resistance.
**Acknowledgements**

I would like to dedicate my master thesis to the very best IMCH family, who made this thesis possible, and to my thesis supervisors Beth Maina Ahlberg and Pia Olsson. Furthermore I would like to thank the ReAct office, which introduced me to Vida Parady, my local supervisor, great mentor and close friend. I would like to thank my co-workers, in particular Dusan Jasovsky, Maria Pränting and Bronwen Holloway, who helped me to finalize my discussion.

I would like to thank Aries Kurniawan, who translated everything into Indonesian and made my life so much easier. Lastly, I would acknowledge this thesis to my family and friends from home, who supported me from the beginning. Thank you!

“I was afraid I didn’t have all it takes to be a good thesis supervisor to you because it’s so much fun to be your friend instead” Vida Parady, Supervisor
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Introduction and Background

During the last few decades, antimicrobial resistance (AMR) has become an emerging high priority global health topic, affecting high, middle and low-income countries. This threatens the prevention and treatment of infections caused by parasites, fungi, viruses and bacteria (10). The three most prominent forms of resistance are antiviral, anti-parasitic, and antibiotic.

Antibiotic resistance can develop either ‘through spontaneous mutations in the microbial genome’ or due to uptake of another genome fragment from another microbe (12,13). The resistance develops in four stages. During the first stage, a lot of germs can be found, of which a few are drug resistant. In stage two, antibiotics are killing the bacteria, which cause the disease, but also normal flora protecting the body from infection. During the next stage, drug-resistant bacteria are now able to grow bigger in numbers and take over the majority of the human bacterial environment. In stage four, some drug resistant bacteria transfer their resistance to other bacteria (14).

There are many reasons for the spread of drug resistance, and one of the main problems is the inappropriate use [both abuse and misuse] of antibiotics in humans and animals (13). The primary use of antibiotics is for bacterial infections.

However, due to the lack of education of both healthcare professionals (15) and the general population (as well as socio-cultural, and economic factors) (16), antibiotics are commonly used to treat a variety of conditions including: viral infections, the common cold, and acute watery diarrhoea. This causes adverse effects, such as resistance to the drugs themselves (17).

Incapacitated communities and hospitals as well as poor hygiene and failure of infection control are promoting factors for the spread of resistance (13). Poor hygiene is of particular concern for healthcare professionals, who might carry resistant bacteria on their clothing or hands for a short period of time, unintentionally exposing

1 A genome is an organism’s complete set of DNA, including all of its genes (11)
2 A visual example can be found in Annex 1
3 Healthcare professionals include doctors, pharmacists, dentists, midwives and nurses (15)
patients and themselves to resistant strains. Furthermore, research has shown that international travel and migration are other factors contributing to the spread of antibiotic resistance, including the risk of being infected while seeking healthcare abroad (18,19).

In an attempt to manage antibiotic resistance at the national level, countries are implementing different policy approaches and guidelines to combat the spread of resistant bacteria. A commonly used strategy is control through restricted market access for medications such as antibiotics, meaning that citizens are not able to purchase antibiotics over the counter (OTC) without prescription. Nonetheless, many countries, in particular low- and middle-income countries, are not following this trend (13). One of these countries is the lower-middle-income country Indonesia (20), which has legalized the purchase of antibiotics over the counter (21).

The resistant bacteria have become a great problem in Indonesian hospitals, where more than 40% of the budget for medication is allocated for antibiotics – and once the bacteria develop to the resistant strain, the case-fatality rate of infections increases (21). The major resistant strains, as described by Sudarmono in 2013 (21) are Methicillin resistant Staphylococcus aureus (MRSA) and extended spectrum beta-Lactamase (ESBL) producing bacteria. The high prevalence of both strains can be used as an indicator for irrational use of antibiotics. Inappropriate prescribing of antibiotics can be caused by insufficient education about the impact of short- and long-term effects of the irrational use of antibiotics (22).

One way of tackling the recent trends in antibiotics and its resistance is to ‘isolate or segregate patients, who carry the’ resistant bacterial strain and to develop early identification methods for microbiological laboratories as well as ‘efficient communication, awareness and education’ programs (13).

As is the case for most diseases, children under five are considered one of the major risk groups for antibiotic resistance, because of their underdeveloped immune system, great exposure to disease-causing bacteria and being subject to age-inappropriate medication (23).
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To comprehend further why children are most affected, one needs to see the deeper context; it is important to ask how children get in contact with medication in the first place. Children receive medication from their parents or guardian when they are sick. Therefore, it is crucial to tackle parents’ behaviour and consequently that of their children. Parents are responsible for decision-making concerning health and the purchase of antibiotics over the counter and, in the end, are important drivers of antibiotic resistance in their families. Therefore, the organisation called Concerned and Caring Parents Foundation (YOP)\(^4\), based in Jakarta, aims to raise awareness and knowledge of rational treatment, such as antibiotic treatment and health conditions for Indonesians (24). Along with their social media campaigns and e-mailing list\(^5\), YOP is giving educational seminars on “The Children Health Education Program for Parents called PESAT\(^6\)”.

One of their projects is called “Smart Use of Antibiotics” (SUA) and was implemented starting from 2012. It aims at ‘creating a more supportive environment’ to improve the prevention of antibiotic resistance among YOP’s internal and external stakeholders (24,25). Within that project, YOP organizes campaigns, such as the “Healthy and Fun Walk”, to encourage Indonesian people to take an active part in raising awareness about antibiotic resistance.

Antimicrobial and antibiotic resistance in Indonesia

The latest report from the World Health Organisation “Antimicrobial resistance: Global report on surveillance” pointed out that Southeast Asia has among the highest rates of antibiotic resistance worldwide. \textit{S. Aureus} infections in particular are known to be methicillin-resistant, leading to non-functioning antibiotics. The WHO-regional director is aware of the emergent topic, saying that “we need to act now to use antibiotics rationally, ensuring their availability for future generations” (26). This trend is not surprising, given that ten years ago in 1998, 70% of patients with diarrhoea and 80% of patients with respiratory tract infection (RTI) symptoms were treated with antibiotics (27). Furthermore, paediatricians in Jakarta prescribed antibiotics to 94% of young children, knowing that the infection was viral (27). The

\(^4\) Yayasan Orangtua Peduli
\(^5\) Milis Sehat (sehat@yahoogroups.com)
\(^6\) Program Edukasi Kesehatan Anak untuk Orang Tua

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local newspaper, The Jakarta Post, interviewed both professionals as well as lay-
people about their attitude towards antibiotic resistance. Pharmacologist Nicolaski
Lumbuun said that ‘Indonesians tend to use antibiotics excessively because they are
available over the counter (28).’

In 2008, 86% of the population did not have any form of health insurance coverage,
resulting in patients paying for services, such as antibiotics, in cash upon delivery
(27). In health centres, only a limited number of antibiotics can be prescribed due to
existing standard practice guidelines for the treatment of infectious symptoms (27). In
addition, ‘due to the lack of awareness [of physicians] of implications, physicians
treat patients with antibiotics to speed up their recovery process.’ On the other hand,
parents report that they ‘hardly ask the doctor why they need antibiotics, or that if
their children feel better, they do not continue the regimen, because their children do
not like medication’ (28). This indicates that the Indonesian government should both
focus on educating health workers as well as the public about rational use of
antibiotics in order to reduce the impact of ‘the global antibiotic resistance crisis’
(28).

The present study is built on three baseline studies, all three carried out by YOP
during 2004 -2006, 2008 – 2009 and during 2010. The first study is from a
quantitative baseline intervention focused on compounding medicine (puyer⁷) prescribing antibiotics to children diagnosed with viral infections that do not need antibiotics, such as upper respiratory infections (URI), fever, acute cough or acute gastroenteritis (GE). The aim of the study was to see the change of puyer and types of medicine consumed after being educated in Jakarta (29). The pre-intervention showed that most prescribed drugs were antibiotics for fever with 86%, followed by diarrhoea 74.1%, URI and coughs, 54.5% and 46% respectively of total medicine prescribed for each disease. The post-intervention revealed a dramatic drop as shown in figure 1 below.

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⁷ Treat sick children with a mixture of several medicines, not necessarily all-appropriate to their needs.
The second, cross-sectional study focused on the prescribing pattern of upper respiratory tract infections (URTI) in the paediatric population based on prescriptions submitted by parents in Jakarta. The study showed that 67.3% of participating parents from Jakarta submitted a prescription for antibiotics for URTIs (30). The researchers suggest that intervention studies in promoting and evaluating Rational Use of Medicine (RUM) should be nationally implemented across different levels such as consumers, physicians, pharmacists, media, MoH and NGOs (30).

The third study ‘evaluated the impact of IT-based education on the knowledge and behaviour on RUM among YOP’s mailing list members’, who also attended the educational classes. Two identical questionnaires were given to the participants before and after attending the classes using closed-ended questions. The knowledge about antibiotics in general went up from 3% to 97%, use of antibiotics for URI, GE and fever went down from 64% to 40%, from 87% to 3% and 6% to 1% respectively (31). The findings suggest that the intervention through IT-based channels has been effective in increasing participants’ knowledge and changing their behaviour towards RUM, particularly if they attended the educational classes (32).

**Conceptual Framework**

The Antibiotic Smart Use model from Thailand can be applied to this study, since the researcher is interested in different stakeholders’ views and social levels, which need to be addressed when conducting a project such as the one from YOP. Within this framework (Figure 2), patients’ health is affected by prescribing practices (supply side) and self-medication (demand side). The theory states that patients with acute conditions are more likely to adhere to medication than those who have chronic conditions, and are therefore more likely to follow the prescriber’s advise (16).
prescription behaviour can be influenced by pre-disposing factors, such as attitudes, subjective norms and perceived behaviour control, as well as reinforcing and enabling factors. Stakeholders from the individual, network, policy and social level have influence on the use of medicine by the patient (demand). The conceptual framework helps to phrase the research question and to find a suitable study population. Since the framework focuses on different levels of the community interventions, the researcher could apply the level of interventions to the recruitment of participants, who represent different parts of the community, therefore interviewing participants from social to individual levels (Figure 2). The campaign “Smart Use of Antibiotics” did not cover the supply side yet; therefore, this study investigated the connection between the different levels and the societal side.

The circle and lines between the different levels indicate the interrelationship between individual, organisational, network, policy and social level as in the socio-ecological model from Bronfenbrenner (33). All levels influence each other in a certain way and build up a dependency. The social and organisational levels influence the individual level because they are responsible for the flow of information involved in the Smart Use of Antibiotics campaign. The policy level influences all other levels because of its jurisdictional power.

Figure 2: Adapted conceptual framework of the antibiotic smart use program (16)
Aim

The aim of this study is to explore factors that influence the use of antibiotics and knowledge about antibiotic resistance in Jakarta, Indonesia.

Research question

What factors influence antibiotic use and knowledge about antibiotic resistance in Jakarta?

To answer the research question, a qualitative study on the perceptions of stakeholders in the YOP campaign “Smart Use of Antibiotics” in Indonesia was carried out based on the following questions:

How do the different stakeholders in Jakarta perceive the impact of the YOP campaign on the smart use of antibiotics and antibiotic resistance in general?

1. What are the driving and underlying factors for the perceived impact of the campaign?
2. What are facilitating and / or hindering factors that influence the use of antibiotics by patients / consumers?

Methodological Issues

Research Design

This qualitative research used semi-structured interviews following a short interview guide (34) (Annex 4). The interviewer was free to ask questions in the conversation that may stray away from the guide, when the researcher considered the topic as relevant and appropriate (35). The researcher chose a qualitative research approach because of its possibilities to offer in-depth explorations of complex phenomena that have not yet been discussed extensively in research and also to highlight overlooked participant groups, such as national civil society organisation (36). Furthermore, the researcher chose semi-structured interviews because of the possibility to explore the participants’ perception and let them speak freely.

8 Patients in general, that includes families and parents with children, but also patients in a hospital
Research setting

Indonesia is a lower-middle-income country situated in the East Asian Oceania region (20) with the capital of Jakarta. Its population is the fourth largest worldwide with 238,518,808 inhabitants (2010) (37), whereas 56% of the population is living in rural areas (38). The population density is 124.66 per square kilometre (37). The Gross National Income per capita is 9,260 (PPP international $). In 2012, the total expenditure on health per capita was 150 international Dollar, and as 3% of total GDP 3.0.

Figure 3: Map of Indonesia (39)

The Indonesian health system is based on the primary healthcare concept, which consists of community health centres supported by hospitals and other community-based healthcare facilities. The responsibility for the national health policy lies within the Ministry of Health (MoH) and covers the overall healthcare programs (staffing, education and health services) (38). The health facilities are divided up by administrative level into village, sub-district, district, province and central level. Within the village level, community-based facilities with integrated health post, maternity huts, sub-health centres; mobile service units and private clinics are available from 1 day per month up to daily service. For the sub-district level (kecamatan), health centres with or without inpatient facilities and private clinics are offered. Inpatient facilities are open 24 hours a day with a specialist team, whereas the outpatient facility is a daily clinic and open during office hours only. Within the district level, first-referral and private hospitals are available, compared to second-referral hospitals in the provincial region. Lastly, at the central level, tertiary or top-referral hospitals are available for patients (38). In 2014, Indonesia initially started to introduce Universal Health Coverage (UHC) for citizens, who are already engaged in

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9 see Glossary for definition (8)
social health insurance schemes (targeted at 120 million citizens). In order to cover the whole population, the Indonesian government planned to introduce the full UHC plan by 2019, which would be the world’s largest social health insurance system (8).

The age-standardized mortality rate for Indonesia shows that the majority of deaths are due to non-communicable and communicable diseases such as coronary heart diseases, influenza, stroke, lung disease, tuberculosis, diabetes mellitus and hypertension. It is notable that Indonesia is ranked number 14 worldwide for lung diseases, which might be due to high air pollution in bigger cities such as Jakarta and to the high smoking rates among men (65.9% of total population) (40).

A detailed health profile of Indonesian is presented in Table 1.

Table 1: Indonesia health profile (41)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Country</th>
<th>WHO South-East-Asia Region (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy at birth (both sexes)</td>
<td>71</td>
<td>67</td>
</tr>
<tr>
<td>Healthy life expectancy at birth (both sexes)</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>Total fertility rate (per woman)</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Under 5 Mortality Rate (per 1000 live births)</td>
<td>31</td>
<td>50</td>
</tr>
<tr>
<td>Maternal Mortality Ratio (per 100 000 live births)</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>Prevalence of HIV (per 100 000 population)</td>
<td>245</td>
<td>185</td>
</tr>
<tr>
<td>Incidence of Malaria (per 100 000 population)</td>
<td>2278</td>
<td>1462</td>
</tr>
<tr>
<td>Prevalence of Tuberculosis (per 100 000 population)</td>
<td>297</td>
<td>264</td>
</tr>
</tbody>
</table>

Due to its ethnic diversity, Indonesia has great variety in demographics. The official language is Bahasa Indonesia, the ‘language of Indonesia’, but varies according to regions, mostly in ‘pronunciation and, to a lesser extent, in vocabulary’ (42). The most common religion is Islam with 87.18 %, followed by Christianity with 9.87 % and Hinduism and Buddhism (1.69 % and 0.72 % respectively) (43).

Jakarta is located on the Northwest coast of Java. It is the most populated city in Southeast Asia with 10.2 million inhabitants (44) and was the location for this study. It is divided into six different regencies, namely South, East, West, North and Central Jakarta as well as the Thousand Islands (45). Jakarta’s demographics vary between different origin; the Javanese population covers 35.16%, natives from Jakarta, also
called Betawi contributes to 27.65 %, Sudanese population 15.27 %, Chinese 5.53 %, Batak, Minangkabau and Malays (3.61 %, 3.18 % and 1.62 % respectively) (44).

**Participant selection**

The local supervisor in Jakarta approached potential participants using her network within the YOP project and investigated who would be interested to participate in the research.

For the present study, the researcher interviewed stakeholders from different areas of Jakarta. The different stakeholders are represented throughout different ‘levels’ including social, network, organisational and individual levels. Local physicians, who are SUA campaign volunteers, as well as paediatricians, represent the participants from the ‘social level’. Close collaborators in Jakarta such as NGOs, media partners and campaign sponsors presented the network level, whereas staff and founders represented the organisational level from YOP. Parents represented the individual level. The researcher interviewed 13 participants, whereby the policy level was not represented. A detailed tabular description of participants can be found in table 2. Female and male participants were equally distributed among the different stakeholder groups.

The following selection criteria were used to identify potential participants: Firstly, the participant should be able to speak English or Indonesian. Secondly, the participant should know about the SUA campaign, which is offered by YOP. Thirdly, the participant should be living in Jakarta Greater Area.

<table>
<thead>
<tr>
<th>Table 2: Research participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stakeholder Group</strong></td>
</tr>
<tr>
<td>Individual level</td>
</tr>
<tr>
<td>Organisational level</td>
</tr>
<tr>
<td>Network level</td>
</tr>
<tr>
<td>Policy level</td>
</tr>
<tr>
<td>Social level</td>
</tr>
</tbody>
</table>

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Data collection methods
Depending on the preference of the participant, the interview was either conducted in English or Indonesian. The information sheet, consent form and interview guide was available in English as well as in Indonesian and placed on the table during the whole interview. The participant was asked if he / she fully understood, agreed and signed the consent form, understood the information sheet and if he / she agreed to the recording of the interview. If the participant agreed, the researcher put two recording machines on the middle of the table and started recording. None of the participants disagreed to being recorded. Out of the 13 interviews, four interviews were conducted in Indonesian together with the translator. The researcher asked the question in English, which was translated into Indonesian and then answered in Indonesian by the participant. The translator translated the answer back to English to enable the researcher to understand.

To get a first overview about the positioning of the participant within the project, the researcher asked the participant about their existing role he or she has at the project. The participant was then asked, “How do you, as a stakeholder in Jakarta, perceive the possible impact of the YOP campaign with regards to smart use of antibiotics and antibiotic resistance in general?” A follow up question was, “Based on your position as stakeholder, are you able to identify underlying factors that make you think that there’s an impact?” and lastly “Do you think you are able to identify facilitating and/or hindering factors that influence antibiotic use by patients / consumers?” The written consent form can be found in Annex 2, the interview guide in Annex 4, and the information sheet in Annex 5.

Data analysis
After the interviews, the researcher transcribed the recordings. In the event that the interview was in Indonesian the researcher analysed the English transcript. To improve the quality of the transcripts and henceforth the analysis, the transcripts were sent to the participants to review in order to minimize misinterpretation. In addition,

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11 In the event that one of the machines stopped working because of technical difficulties, the researcher used two recording machines instead of only one.
12 The participants were told in which level they were classified (classification is used for result section), however participants could also explain their perceived stakeholder role, and whether this role differs from the role they were put into.
transcripts, which originated from a translated interview, were reviewed through an independent translator, who was not present at the interviews\(^\text{13}\). This helped to minimize deviations from the original transcript. The transcripts were then analysed using Qualitative Content Analysis, as described by Graneheim and Lundman (35). Throughout the analysis, meaning units were identified and condensed into codes, category and themes. Meaning units specify parts that relate to the aim of the study, whereas condensed meaning units are shorter but preserve the core. Later on, codes identified to label the condensed meaning units. Categories are developed through grouping codes that are similar in content (46). Through the process of analysis, one theme could be identified, namely “unite our voice to address antibiotic resistance from all angles”, as well as five categories, namely education, trust, media, policy and culture. An example of the analysis can be found in table 3.

**Table 3: Path of analysis of Qualitative Content Analysis**

<table>
<thead>
<tr>
<th>Condensed meaning units</th>
<th>Code</th>
<th>Subcategory</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>The government needs to realise that this antibiotic resistance thing is a global thing</td>
<td>Realise that something needs to be done</td>
<td>Policy and guidelines</td>
<td>Politics</td>
</tr>
</tbody>
</table>

**Reflexivity**

As this study is conducted through semi-structured interviews in a country other than my own origin, the concept of reflexivity needs to be applied into the analysis as well. Reflexivity can be defined as ‘an attitude of attending systematically to the context of knowledge construction, especially to the effect of the researcher, at every step of the research process.’ (47). As a German Master’s student studying International Health at Uppsala University, I had never travelled outside of Europe, making the data collection my first trip to Asia. I had little expectations of the trip, other than having the chance to interview participants about their attitude towards the SUA campaign. In advance to the field trip, the independent translator gave me a “culture crash-course” to facilitate the adaptation to Indonesian culture and give a short introduction to Indonesian history.

\(^{13}\) The independent translator is friends with the researcher, an Indonesian citizen, living in Uppsala and was also responsible for translating the research protocol
It might have been the case that study participants were acting differently than they normally would, due to the fact that they tried to make my experience as good as possible. Another important aspect is the adaption to Indonesian culture and religion. Raised and living in a Christian / Catholic-structured society, I am not used to the Islamic religious practices, for example prayers and women wearing Hijab. Therefore, it took some time to adapt to the Indonesian way of life and the inclusion of religious practices into every-day life. Nevertheless, my religious background and position in the society did not influence the data collection or opinion towards the study participants. Every human being is allowed to think and believe in whatever he or she desires, therefore I treated all participants with the same respect and attention as anyone else. Furthermore, during the data collection period, I was fully aware of my appearance towards the participants, meaning that I did my best to dress and behave as culturally appropriate as possible. The local supervisor advised me to dress appropriately for different interviews, depending on the participant’s belief.

**Ethical considerations**

The section on ethical considerations deals with the principles of ethical conduct as described in Qualitative Research in Education: a User's Guide (48).

The participants were made aware at the beginning of the study that they will not be exposed to any harm and were free to withdraw from the participation at anytime without providing information. It has to be noted that the researcher shared the participants’ contact information with the thesis supervisor, because the supervisor was responsible for the recruitment of the participants. Furthermore, the supervisor acted as translator during four interviews and was introduced to the participants at three other interviews, which was agreed to by the participant prior to the interview. Nevertheless, the presence of the supervisor / translator did not have a significant impact on the quality of the outcome. For the data analysis, the transcript was shared only with the participant for quality control purposes.

The researcher distributed the informed consent form (Annex 2) to the participants before the interview, which was read, understood and signed by the participant. The researcher signed a statement as well that confirms that she read out the information
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sheet to the participant, and that the participant understood it to his or her best abilities (Annex 3). Furthermore, the researcher handed out an information sheet for the study participants before the actual interview, which entailed information regarding the research, objectives of the study, confidentiality, benefits, consequences and hypothetical harm (Annex 5).

The researcher made sure that the research environment was comfortable for the participant, allowing them to share their opinion without being exposed to any kind of judgment. This was particularly important when participants asked whether their answer was the right answer in accordance with what the researcher was looking for. The researcher replied that no answer was wrong because the answer given presented the participant’s opinion. The main researcher took care of the data and does not share it with third parties, other than the ones indicated in the information sheet (48). The study participants who were interviewed in Indonesian were notified that an independent translator had access to the audio recordings to check the translation. All participants agreed to the quality control. In order to insure confidentiality, the independent translator signed a confidentiality agreement to protect the participants’ responses (see Annex 6).

Results

After the analysis of the thirteen interviews, the researcher identified one major theme, “Unite our voice to address antibiotic resistance from all angles”, and five major categories that can explain the use of antibiotics and knowledge about antibiotic resistance in Jakarta. The first category covers the educational factor, including education for healthcare professionals and patients as well as their level of awareness. The second category includes the media aspect, in particular online and offline media. Category three is about the policy approach, including policy and guidelines, drug availability and accessibility and stakeholder involvement. Category four is culture and includes habits and behaviour of patients and healthcare professionals, the doctor-patient relationship (DPR) and the environment / surrounding factors. Lastly, the category trust displays the trust in healthcare professionals from the patient side, internal trust among healthcare professionals, trust in medicine from the patients’ perspective and trust in the system (healthcare system and government).
Education
Education could be seen as the most prominent factor throughout the interviews. Every participant, irrespective of stakeholder position, mentioned at least once education as an important factor.

First of all, the difference between awareness and education of the different stakeholders needs to be mentioned. The data indicated that participants associated awareness to a person who is aware of campaigns and the right use of antibiotics, but does not actually put the knowledge into practice, whereas an educated person implements the acquired knowledge into practice and helps to spread the message of smart use of antibiotics.

Education of patients
During the interviews, several different patients groups that are in need of special education were identified, such as families, mothers, lower class society and children in schools. One participant mentioned that mothers from the middle- and higher-class society could educate their children’s caretaker (mostly from lower class) and therefore transfers the knowledge about rational use of antibiotics.

“[The mothers] mainly have other caretakers for their children, [who] are mostly from the lower class. […] The mothers should also educate the caretaker, […] to not give antibiotics to the children. So that’s how […] it is possible to transfer the information to the lower class. Currently they don’t have any channels […] to approach them directly […].” (Participant 13)

There are many ways to educate patients about the rational use of antibiotics and ABR. YOP’s major channel to educate their members is PESAT, which aims to empower the patients to know their rights and obligations. Participants mentioned that PESAT is more effective compared to normal doctor consultations because the doctor in PESAT is able to educate patients on antibiotics only for a longer period of time. Moreover, patients can become “agents of change” so the information about ABR can be spread further. However, participants also pointed out that it is necessary to educate patients on how to communicate with their doctors in order to facilitate the doctor-patient relationship. One participant mentioned the connection between media and education, and that nowadays, people become educated through various media channels.
“I think it is closer and more effective. Because when you go to the doctor, you will have some consultation [...] We have only 20 minutes [...] for every consultation. [...] But for the long term, for PESAT, [...] we have forty-five to sixty minutes to talk about antibiotics only.” (Participant 1)

“Now from social media, [...] more and more consumers are educated and there are seeking for getting more knowledge in the antibiotics use in media.” (Participant 9)

Moreover, the willingness to learn is also considered as important. One participant said that if patients are willing to learn, they change dramatically and become more knowledgeable about when and how to use antibiotics.

“[If] we are able to engage them in the focus group discussions; it will change their view tremendously. We already have proof that when we test before and after antibiotic sessions; their view about antibiotics will change dramatically.” (Participant 2)

**Education of healthcare professionals**

Participants said that the PESAT sessions make them more competent to translate medical terms into lay people’s language. This facilitates the uptake of information and comprehension of both the healthcare professionals and patients. Moreover, healthcare professionals are considered as rather ignorant to the actual diagnosis of the disease and rather prone to write prescriptions. They should become more interested and learn about the implications of their actions. One participant suggested that in order to increase doctors’ competencies, the policy level should be addressed as well.

“They are ignorant to find out about the diagnosis. [...] But now they start to find more information and there is the interest to find more about pharmacology and diagnose.” (Participant 5)

However, it needs to be pointed out that there are still doctors who are hard to change. Some doctors already know that they should not prescribe antibiotics, but they still do because they are afraid that the patient will leave to go to another doctor that will prescribe them antibiotics. In addition, one participant mentioned that some doctors have a tendency to give out template prescriptions, which leads to potential under or over-dosing of their patients.

“So the doctors have a tendency to just give them [...] a template prescription. Whatever the illness is, they give the same prescription and even the dosage is not customised. So some patients are basically overdosed.” (Participant 5)
“If Indonesian patients come to you [and] you are not giving any drugs […], the patient will go and feel disappointed, because they already pay you and [you] didn’t [prescribe] any medication. They still have the feeling that they are afraid of losing patients.” (Participant 1)

The participants’ conclusion was that the existing medical education should be improved immediately. It was mentioned that university professors should improve their educational classes and teach students more about the impact of antibiotic resistance, but also provide education for practicing doctors to keep them up to date with the latest developments.

“The social level can improve the use of antibiotics […] through their students, because some of them are teaching at private universities.” (Participant 11)

**Awareness of patients**

Raising awareness and getting patients’ attention is the first step towards their education. There are several ways to encourage patients to become interested in the rational use of medicine, such as Focus Group Discussions and PESAT. One participant noted that people still look at the campaign as if it is not important, because they cannot comprehend the real impact.

“It is needed that people [are] specifically interested in this matter first, then he or she is willing to learn and then we are trying to get their attention, that is the hardest part.” (Participant 2)

As a consequence, the patients become critical when they receive prescriptions for antibiotics and start to ask more questions about its necessity and general questions about antibiotic resistance.

“People are now more critical when they receive the prescription of antibiotics. […] They find more information about it when they are necessary or not […]. Previously they take it for granted, they get the prescription and they just buy it.” (Participant 4)

Furthermore, it has been mentioned that the patient has to be actively involved in the dissemination of information. Participants pointed out that they should become promoters of smart use of antibiotics and that YOP should not work for them, but rather with them.

“The participants [are] not [seen] as part of the promoters. [You should ask them] “How you [can] influence [as] being promoter of the safe use of the medicine […] and how YOP can equip them to be a promoter.”” (Participant 3)
Awareness of healthcare professionals

The awareness of healthcare professionals can be put into three different areas. The first stage is the persistent irrational behaviour, which could be identified by the participants. One participant pointed out that midwives and nurses are able to hand out prescriptions for antibiotics without thinking about the consequences of their actions.

“The midwives, the nurses, they prescribe antibiotics without knowing the real problem.”
(Participant 9)

The second area covers that the professionals start to recognize that the patients are changing their behaviour, getting smarter and becoming more critical towards the professionals’ decision. However, some professionals seem to remain reluctant, saying that it is not up to them to decide what to do.

“Previously I just took whatever the doctor prescribed me for the children. But now I ask them questions like why do we need this medicine?” (Participant 13)

“Then they say that “well, it is not something that all of us need to adjust together.” So that’s the reluctance.” (Participant 2)

Nonetheless, there are still some professionals who showed interest in the campaign. Since antibiotic resistance matters are increasingly brought up in global politics, more Indonesian experts are becoming interested in working in this field and they are able to raise awareness among their peers, such as members of the MoH in Indonesia. One way to raise awareness among health care professionals is the distribution of information materials in healthcare facilities and official organisations, where personnel could access the information.

“The experts become more, and that’s also the cause that the awareness is better than before”
(Participant 8)

“We know that some staff of the Ministry of Health fortunately access our website or mailing list. Maybe they can […] start large discussion and hopefully, […] educate the people in remote areas.” (Participant 9)

“We put posters and through the Ministry of Health we are helped to put the posters in the health facilities. So again, it’s an indirect approach. So hopefully, the doctors will read it.”
(Participant 11)
Media

Online Media

Online media include social media, mailing lists or website entries which can be accessed by patients in Indonesia. Firstly, the distribution of information was thoroughly discussed during the interviews, whereby participants noted that online media could be spread easily. This referred to the PESAT educational programs, which are held for parents by YOP doctors in Jakarta. This is also a way to actively engage unpaid volunteers from all over the country, who are not able to meet in person. Moreover, online media was seen as an interactive tool that connects patients and healthcare professionals, as well as patients and healthcare professionals among themselves, and facilitate the uptake and sharing of information. However, it needs to be stated that flow of information is only able to work correctly if its users are not misusing online media, for example by writing false statements.

“Online media can be spread out more easily compared to a face-to-face discussion” (Participant 1)

“Media basically […] shares information from different sources so that the [patient] can give it another thought before taking action. […] Media can push credible research reports, findings or interview experts […]” (Participant 13)

Secondly, online media can be used to effectively raise awareness within the different societal levels and communities through videos and comics, preferably shared by healthcare professionals. Online media was seen as a big factor that influences behaviour of people, however not sufficient to tackle behaviour on its own.

“Social media is very helpful but of course is not […] sufficient. It has to be supported by continuous effort through the social media.” (Participant 11)

Thirdly, the use of e-mails, so called mailing lists, was seen as a very useful tool to distribute information and educate patients towards the rational use of antibiotics. Healthcare professionals, who are working together with the SUA campaign, are answering questions from parents and patients regarding antibiotics and general health related questions. It is considered to be a good tool to interest and educate people, as well as a continuous channel to get in touch with the community.

“I really use [social media] to educate my patients and some of my friends and followers are general practitioners” (Participant 9)
Nevertheless, there is a controversial part in the use of online media as a tool of information distribution, because access to online media is limited to people from the medium to higher class. Therefore, the part of the population that actually needs education to allow them make informed choices is not able to access this kind of information. Participants said that this is one of the reasons why the campaign does not have as big of an impact as it could have if everyone would have access to online media.

"Because YOP is Internet-based organisation. As an organisation, we can only access those who have [Internet] access. So we are hoping people that we are educating in the mailing list and in PESAT will spread out the words." (Participant 7)

Offline Media
According to the research participants, offline media includes television, print media, newsletters and radio. The participants mentioned the necessity of offline media, which acts as a communication tool to address the mid- to lower societal level, who do not have Internet access.

"[The] lower income [level] we can't reach [...] through IT-based activities." (Participant 11)

Another source of information for citizens with no Internet access is television. Through television, people have the chance to become educated and learn, if the shows are promoting healthy behaviours. One participant raised the point that TV should rather educate people about good things than bad ones, showing them how to behave the right way and promoting good behaviour (rational use of medicine) instead of pointing out bad examples, such as ways not to use medicine, in order to empower citizens to make the right choices.

"And like in the TV, so many mothers see the TV every morning so maybe more discussion about that in the TV. This [...] TV is a very good media. I think, because maybe like Internet or twitter is good but it will not reach the people in rural area." (Participant 12)

A common thread throughout the interviews that touched upon the media factor includes the effectiveness of offline media compared to online media. The participants pointed out that through printed media, the reader does not get lost in the over-flow of information they experience through the Internet. When reading an

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14 This will be further discussed in the discussion part “construction of inversed care law”
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article on the Internet, people tend to just read the headlines and go on to other articles. However, when reading a news article in printed media, people are more likely to proceed and read it.

“I think YOP also becoming more effective in using the printed media. I read some articles in the printed media but I don’t know how they also use the electronic media. [...] I don’t have time to watch or listening to it, because I don’t know when they are on the radio” (Participant 3)

“They only read the title. But the printed media, probably they can easily read all [...] There is a difference between online and printed media and in one page you can read everything but in the online [...] there is like “see more, see more” and then you get lost.” (Participant 3)

However, participants also described that both media channels are complementing each other, in the sense that printed media is supported by social media to increase the up-take within and outside of Indonesia. More patients start to know about the rational use of antibiotics through social and print media. In addition, offline media is used to assist campaigners in distributing important messages to the community, which cannot be done through online media. Since Indonesia is a very big country, the spreading of campaign messages needs to be done through various channels of communication to reach the majority of population, which for example have no Internet.

“Because even commercial products [...] use social media. [Offline] media should be supported by social media.” (Participant 6)

“The role of the media [...] is important to bridge between YOP as the campaigner” (Participant 6)

Policy
Three categories were associated with the theme of policy, namely policy and guidelines, drug availability and accessibility as well as stakeholder involvement.

Policy and guidelines
Policy and guidelines were associated with better and stricter policies for healthcare professionals, facilitating a rational behaviour of prescribing antibiotics in public and private hospitals as well as providing gatekeeping behaviour among pharmacists. Addressing policies and guidelines for antibiotic use and resistance is of great
importance for Indonesia and the rest of the world. Participants feel that the government does not take antibiotic resistance seriously enough to call for a change in policy and neglects preventive care, mainly focusing on curative care.

“I think that the most important factor that needs to be addressed [is] the policy or guidelines.” (Participant 1)

“But now that the whole country, this antibiotic resistance movement is a global thing. That is no other that the government will start realizing the big problem of it. And they will start realizing the big problem of the population.” (Participant 11)

“I have expectations that the government takes a more active role and not only in terms of curative part, but also in promotive part and prevention” (Participant 5)

Several participants mentioned the general attention of the government. It was suggested that Indonesia is lacking relevant research that would provide the policy sector with results, which then could shape evidence-based policies. In addition, the participants pointed out that they were missing the government’s attention to know how to engage more people to spread the information.

“Maybe if there’s result of research, could explain about what happened in our health facility. So the government will try to do more reinforcements in the clinics.” (Participant 8)

“I think well, the attention the people, we got it. The attention of the government not yet. I think that’s the need to address. How to engage people to do more attention.” (Participant 2)

Next to the general attention, participants pointed out the need of government support but also their need to put pressure on it, suggesting that pressure needs to be applied first to receive support from the government and communicate issues from both sides. Participants mentioned that stakeholders should put pressure on the government to create a policy, which allows for the reporting of doctors violation from the patient (consumer) and healthcare professional side. In this sense, if one doctor sees that a colleague is wrongfully prescribing antibiotics to a patient, the other doctor is allowed to report it to the governing institutions without facing consequences such as losing his or her job or respect from colleagues (more on that will be described in the internal trust section). Moreover, the government should create a policy that puts pressure on the healthcare professionals to be transparent with the patients. In this context, the healthcare professionals should give out more information to the patient.
“How the social level can make a pressure on how this is implemented [...]. When the health workers [give the patients more information] rather than directly give them the medicine” (Participant 3)

Participants also mentioned that they would like to see some support from the government. One participant stated that the social, individual, organisational and network level should try to influence the policy level, because there are no regulatory incentives for raising awareness of the importance of antibiotics and its resistance. Moreover, the participants pointed out that education for healthcare professionals and patients will have a bigger impact if the government would have supportive regulations. One participant also mentioned the problem with the rural areas. Since Indonesia is such a big country, more doctors and nurses should move to rural areas and provide sufficient healthcare there as well.

“I think of these five levels, four of them have to try to influence the policy level. Because now, there’s nothing between the relation and the regulatory support to our campaign is almost nothing.” (Participant 4)

“What I’m saying is the YOP’s main role is educating the consumer. And this will have bigger impact if the government is [to] balance it with creating more supportive regulations. So it should be balance between spreading the information to the consumer and supporting the regulations by the government.” (Participant 6)

Lastly, the participants mentioned the necessity to implement guidelines in healthcare facilities, which benefits the healthcare professional and the patients equally. One participant talked about the importance of a more regular distribution of guidelines by the healthcare society to the individual healthcare professional in order to strengthen empowerment, their own capability and decision-making processes. Others raised the issue that hospitals should have guidelines, implying that currently there are hardly any. This was particularly pointed out in regard to the private sector. Once healthcare professionals and patients comply with the guidelines on antibiotic use, the misuse will decline as well.

“And I think if the society can give the disseminated guidelines that regularly “this is the common problem, you must not give any antibiotics” I think it will make the paediatrician get more strength in their capability.” (Participant 1)

“Hospitals should have guidelines that only some condition should have antibiotics [...] They really have strict condition that we can get antibiotics in the drugstore, in hospital and
doctors, even if doctors prescribe it, in the prescription paper, even if the pharmacists know that there are any indication, the pharmacist can stop the doctor to prescribe.” (Participant 9)

Because if we comply [with the] guidelines, some of the antibiotics overuse, underuse, or misuse, will be solved. (Participant 11)

Drug availability and accessibility
Availability was referred to as the extent to which antibiotics could be received. Accessibility referred to the ability to receive antibiotics in terms of proximity. One participant pointed out that because of the current structure of the national insurance system, patients have to purchase antibiotics out of pocket, which leads to the present behaviour of most Indonesian citizens, namely to buy antibiotics over the counter in unlicensed pharmacies or drug stores.

“The drug regulation in Indonesia is really bad. You can buy antibiotics yourself. Even at the bag it’s written ”only by medical prescription” But you can buy it anywhere you like. The pharmacy will give it without any prescriptions. And nobody feels bad about it.” (Participant 7)

Moreover, the participants reported that it is possible to purchase antibiotics without a prescription at the pharmacy. It was noted that if accessibility were limited to prescription-only antibiotics, the antibiotic use would become easier to regulate.

“In social level, well I think that maybe the policy of antibiotic prescribing like patients may not get antibiotics without prescription.” (Participant 9)

Regarding availability, participants pointed out that one can buy antibiotics everywhere, leading patients towards self-treatment rather than listening to the doctors’ advice. Furthermore, the increasing availability of generics needs to be considered when talking about drug availability. People can’t afford to pay for antibiotics and they therefore fall back to second-class medication, such as generics.

“It’s probably the availability of generics. So previously – medications are quite expensive, so people cannot afford it but now government tries to promote the generic. So they are available at the market and people can get access to medicines.” (Participant 13)

In addition, a participant introduced the concept of safeguarding, where pharmacists should be allowed to decline to give out antibiotics to a patient even if the patient has a prescription. This approach might open room for ethical debate, where it needs to be discussed whether pharmacists are allowed to proceed in this manner or not. The
participant also suggested that doctors needed to forward the patient’s blood culture to the pharmacists.

“The pharmacist can stop the doctor […] if the doctor prescribes second line or third line, he or she must show the […] blood culture of the result. If they cannot show the culture, they cannot get second or third line. Like safeguarding. Doctors only can prescribe first line antibiotics and the pharmacy has the right to stop the doctors to prescribe second or third line because they are not able to show the culture. Because there’s no proof and also if doctors must show the diagnosis of the patient, if the diagnosis is clearly viral infection. Even though the doctors are prescribing antibiotics, the pharmacist may not give the antibiotics to the patient.” (Participant 9)

**Stakeholder involvement**

The range of stakeholders mentioned in the interviews varied from student associations, international as well as national organisations, ministries, private sector and public sector organisations. Participants pointed out the need to increase the number of volunteers working in YOP such as students, parents and healthcare professionals, but also increase the range of partner organisations to include midwife organisations, pharmacist organisations and non-health related ministries such as education, home affairs and agriculture as indicated in the following quotes:

“And secondly [...] the government also collaborate with the professional associations in this case the Indonesian Pharmacists association to tackle this issues.” (Participant 5)

“YOP can work with the association of the midwives and also women’s group in the ministry of home affairs.” (Participant 3)

“We are also thinking how to approach those sector non medical sectors. Agriculture, poultry, fishery” (Participant 11)

Participants were also concerned with the fact that the Indonesian government needs pressure from international organisations, because the pressure will not be as strong if it comes from inside the country. Only then would the government pay attention.

“Because normally, when it comes from Indonesia, [...] the pressure will not be considered as that strong. But when it's being pushed by foreign, multilateral organisations, like UNICEF then the government starts paying attention. Then I expect that international organisations like ReAct are doing a study on Indonesia, so it will put more pressure on the government. So what I want to see that international organisations like ReAct having a survey to the consumers in Indonesia, like five big cities and then use that data to basically write a report
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and then show the government "look, this is how bad the antibiotics in Indonesia". So you have to create pressure or something using the data." (Participant 4)

Furthermore, it was argued that many different stakeholders could impede the progress in policy making and campaigning, since even if they have the same message, every organisation has its own agenda and way of reaching their aims. Therefore, it is important to agree to certain conditions in order to decrease conflict of interest. This is of particular importance for public and private companies, which advocate for the same campaign.

“The condition is quite hard here in this country, because there are too many policy makers, there are too many doctors, there are too many experts that have different opinion about the use of antibiotics.” (Participant 9)

Culture
The category culture encompasses three sub-categories, which are as follows: habit and behaviour, doctor-patient relationship and environment and surroundings.

Habit and behaviour
The behaviour of patients and healthcare professionals is strongly connected to traditional habits, inherited by their parents and grandparents. Therefore, people continue to practice self-medication with antibiotics, because that is what their ancestors did already years before them. Even during medical education, one participant mentioned that he never questioned the use of antibiotics for a runny nose because he was not taught that it was incorrect behaviour. Nevertheless, due to the over-prescription by healthcare professionals, patients perceive that if the doctor is not giving antibiotics anyway, they do not need to go to the doctor and buy it themselves.

"Once I used to believe that, if you have runny nose with greenish liquid... once I believed it... when I was a child, even my mum gave me antibiotics. I [went] to Med School, I still believe that. And never, [anyone] has told me that it was not right, [...]. Myths like that are... people hear it all the time. Things like that - Anyone wants to correct it, maybe they think it's useless or something. So it becomes a bad habit. So in Indonesia, if you have greenish mucus, doctors will give you antibiotics, the patient will buy antibiotics themselves at the drug store. So it’s a bad habit” (Participant 7)

“Like habit, traditional. Based on many studies, [which] were done by my students, when they ask people “why do you take this medicine?” It’s because of the habitual; it has been
developed for years. And then at first, they learn from the doctors. The doctors prescribe this medicine, but then because it’s repetitively done by the doctors, so it becomes a habit at ... now they are right, they take that medicine and it’s just a tradition.” (Participant 5)

One way of breaking this cycle is to educate children early on about the smart use of antibiotics in order to educate the future generation of parents and pass on the rational use of antibiotics, creating an educated future society.

“Maybe if ... it is actually good to teach the kids from early age of ... being careful of using medicines and I think that it may also prevent them from using drugs. So it's a good thing to learn from early stage.” (Participant 13)

Another important part mentioned the relationship between the doctor and the patient that influences the behaviour of each party. On one hand, the healthcare professionals need to educate the patients about the rational use of antibiotics, while on the other hand, doctors need to step back from their superior role and instead try to empower the patient to make the right decision. Due to the existing power relationship between doctors and patients, patients do not listen to the doctor actively, but rather just wait until the doctor prescribes medication, without questioning the decision. In the situation of the PESAT, which ideally should be led by parents for parents, participants pointed out that most parents do not listen to fellow parents, but rather take their questions to the healthcare professionals.

“They still think, “I’m the doctor, you’re the patient” So just do as I said [...] but the parents are also, ... they volunteer also, they do it in their spare time. We have several training for the parents to ... we give them knowledge and how to speak it to other people. They don’t get the chance to do it very often in PESAT. Because the demand is, doctors speak, not the parents speak in PESAT” (Participant 7)

The phenomenon of role distribution can also be seen between younger and senior doctors. Participants said that younger professionals do not have the courage to talk to senior healthcare professionals when they observe that the senior is wrongfully prescribing or dosing medication.

“Maybe because of the culture here in our country I [am] just [a] junior paediatrician, I don’t have the braveness to face my senior. I will not tell the other guy “Hey, you have miss-prescribed antibiotics”. But I will try to explain [to] the patient who enters my room, maybe they’ve seen the other doctors and they’ve gotten the antibiotics easily. Then I’ll explain, “In my opinion, you don’t need antibiotics. Your condition is caused by virus, not [by a] bacteria.” (Participant 9)
**Doctor-patient relationship**

In general, the doctor-patient relationship (DPR) is considered as very fragile, since doctors and patients are on different hierarchical levels. Participants said that their relationship should be equal to facilitate better communication during the consultation.

*And then for the doctor and patient relationship it actually, they want the patient to be smarter and more critical, so the doctors can see that actually the patients do not take whatever the doctor says. They actually ask questions and clarification from the doctors.*

(Participant 13)

Moreover, one participant pointed out that doctors want patients to become smarter and become empowered to ask more questions.

*“They [the patients] know that they need to ask the diagnosis in the medical term and you know that they have the right to the second opinion. So, it makes the doctor-patient relationship more equal, not just as a subject, as the objective within the relationship.”*

(Participant 10)

Nevertheless, the participant had many points of critique regarding the DPR, including the God-like positioning of doctors in Indonesian society and the perceived knowledge gap between doctors and patients. One participant specified that doctors are seen as superior to the patient and would act defensively, blaming the patient for mistakes. On the other hand, one participant mentioned that doctors rely on patients, because if they do not have patients, they do not earn money.

*“Because in Indonesia, usually the patient is the doctors field, like they are superior to the patient. If a patient, who does not have any medicinal background, does not want any treatment from me, so the doctors have a defensive approach. If there are many patients going to many doctors and discuss not elegantly, not appropriate, so it will make the doctors community a defence mechanism that “the wrong decision is in the parents, not in me”.”*

(Participant 1)

Yet, some participants see a change in the healthcare professionals. One participant stated that if the patients start to ask questions to the doctor, the healthcare professional tries to do better and improve the consultation and becomes more understanding of the patients’ situation.

*Because if they do something wrong, the patient could complain, because the complaint situation is different before and now. So I think if the patient starts to ask the doctor, the doctor also tries to do better.”* (Participant 8)
Environment / surroundings

Environment and the surroundings of patients and healthcare professionals can be understood from various angles. Firstly, the concept of support and environment needs to be explored. Participants mentioned that through the mailing list, people could exchange tips, share their own experiences and create a supportive environment that allows patients to feel empowered. Patients are more likely to share information if they know that i.e. Smart Use of Antibiotics is helping them, giving out information to family members and colleagues.

“We always encourage people that already know about things to share with other people - family, colleagues at the office or people in the neighbourhood.” (Participant 11)

Furthermore, participants identified that it is important to talk to the most influential person in the family and that this person is usually not present at the PESAT. It is necessary to identify the most influential person and educate him or her to take the step forward to the rest of the family. If the grandmother is the most influential person in the family, but the mother is becoming educated, the passing on of the education is most likely lost.

If we want to change [someone’s] behaviour, […] we must […] know who is the most influencing person in the family. So if the most influencing person in the family we can identify, we can spread the message to that person.” (Participant 1)

Lastly, one participant pointed out the connection between environment / surroundings and religion. Due to the variety in ethnicities and religion, the participant believes that education about the importance of antibiotic resistance and antibiotic use should also be run through religious leaders. The participant argues that the people who pray in the mosque form their own small communities. This would be a great way to distribute information to all levels of the society, disregarding the difference between lower, middle and high status levels.

“Education should be run through the culture […] Indonesia [has] more than 500 [ethnicities] and each [ethnicity] as their own believe. […] Also from […] the leader of the religion, like a priest […], because maybe if something […] is not really understandable by people, like in my around my house where I live and they have their own community in the mosque. Every Tuesday they gather there and read Quran and they hear the … we call it ustad, he leads the meeting, so gives the advice […]. So from the people like this, they just give, have to repeat it again and again [in a] very soft way. Both sides, I think education through this ways of culture and religion.” (Participant 12)
Trust

Throughout the interviews the theme trust was re-occurring. It needs to be noted that trust is strongly associated with the theme culture. However, due to its prominence in the data analysis, the researcher decided to put trust as a separate theme. Trust can be classified into four categories, such as trust in the system, trust in healthcare professionals and internal trust among healthcare professionals as well as trust in medicine. Trust in the system includes trust in the healthcare system and trust in the society as a whole, trusting that the system is working to the best of its abilities. Trust in healthcare professionals entails how patients trust that their healthcare professionals are doing the right thing, making decisions for the best interest of the patients. Internal trust among healthcare professionals stands for the trust healthcare professionals have in each other, including relationships between younger and senior doctors. Trust in the medicine includes the trust patients have towards the medicine they are taking through self-medication or prescription.

Trust in the system

During the interviews, participants mentioned the fact that most consumers do not know about existing guidelines and any proper promotion about it, leaving no reason to trust the existing system, since it has worked for years already. Once guidelines would be implemented in a transparent and consistent way, people would start trusting the system more.

"But first the consumers don’t know about it and then it’s only in Indonesian, they don’t share the information with the public.” (Participant 4)

"The key is consistency. Because we have been consistent spreading the messages, saying the same thing basically, so people have trust on us, so they see us as a credible source and that the consistency that basically makes this sustain.” (Participant 6)

One important aspect within trusting the system is the private sector. According to the participants, the private sector can be described as very liberal in obliging to guidelines, with a high rate of irrational prescriptions of antibiotics. Moreover, it is assumed from what the participants are saying that citizens are going to privatized healthcare facilities because they believe that if they are paying more, they will automatically receive better care. Taking the above-mentioned into consideration, this
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Simone Mohrs

assumption could create a very unsafe environment for patients that choose private over public care.

“Even the mid society, may become poorer, or poor if they are sick. Especially, because they go to private sector because they think, for paying you become safer and better care. Which is untrue.” (Participant 4)

Trust in healthcare professionals

As already touched upon in the previous sections, patients accept the doctors’ opinion. However, since healthcare professionals are often over or under prescribing antibiotics, the patients need to become empowered and start to think for themselves as well. Participants pointed out that if people were uninformed, they would most likely follow the doctors’ advice irrespective of their social economic status. Even patients from a higher class think that since they have a doctor, they don’t need to be concerned about it anymore. People think they go to the doctor because they need medication, not to identify the actual disease or diagnosis.

“So, the uneducated people they just do what the doctor says.” (Participant 7)

“The patient from the higher education, they think that they have the doctors so they also shouldn’t learn a lot of things because they should give it just to the doctor.” (Participant 8)

One participant said she educates the students to be more cautious when they have a doctors’ consultation, reminding them that the doctors’ prescriptions are not always correct. Nevertheless, it could be considered as very difficult to bring everyone up to the same level of education to be able to question a doctor’s opinion.

“It’s not a guarantee that the prescription of the doctors are correct. They need to be more critical and then look [at] the diagnosis first and then assess whether the medicine[s] are the correct [...].” (Participant 5)

Internal trust among healthcare professionals

A re-occurring thread through the trust factor was the internal trust between young doctors and senior doctors, where the senior doctors were seen as superior compared to the younger doctors. Participants stated that during their residency, doctors would follow the seniors without questioning their judgment. Even if they personally do not agree with the seniors’ decision, they still do as they are told, because they think the senior has more experience and does a better job.

“Because even me, when we think he or she is our senior, so he or she must know a lot of things better than me. So you just follow it.” (Participant 7)
What is crucial according to the participants is that medical students need a role model to guide them through their residency, and whom they are not afraid to ask questions regarding diagnostics and choice of medication. Moreover, through this approach, younger and senior doctors would engage in an equal positioning and a better working environment.

“The thing that the medical student, [...] really need is the good role model. It’s patient safety champion from doctors.” (Participant 11)

One participant stated that while he was in medical school, he did not tell anyone that he was affiliated with YOP, because he was afraid he would not be able to continue his education.

“So, me and my friends, when we were still in the [medical] school, we [did] it secretly. We don’t want our bosses in the faculty [to] know what we are doing, because, if we do [...], we might get in trouble. Some of my colleague is paediatrician resident so if there are teachers know what they are doing, they might get suspended” (Participant 7)

Trust in medicine

Lastly, the participants talked about their trust in medication, prescribed or self-medicated. One participant mentioned the fact that patients have a misconception about antibiotics, thinking that antibiotics are magic saviour for all ailments. For example, they do not believe that oral rehydration solution (ORS) is able to help them for diarrhoea more than antibiotics, because it is cheap and can therefore not be effective.

“I understood that one of the factors in [...] irrational use of medicine [and] antibiotics, is the misperception in the community [...] people often pressure doctors ... people think that antibiotics is a magic saviour, no matter what your problem.” (Participant 11)

Discussion

The analysis of the data suggests that there are five distinct factors, namely education, policy, media, trust and culture, that contribute to the situation in Indonesia today. Each factor can be sub-categorized into different areas, which are connected to each other. The framework in Figure 4 gives a visualization of the connection. A detailed
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A description of the framework can be found in Annex 10.

Figure 4: Factors influencing antibiotic use and knowledge about antibiotic resistance

Inclusion of religious practices

Recent literature suggested a connection between spiritual beliefs and adherence to medication (49), whereby patients reported to be less adherent if they are highly spiritual compared to those who do not have strong beliefs. Therefore, it is important to focus on the involvement of religious stakeholders and patients / healthcare professionals in order to improve the trust in medication as described in Figure 4. Due to the high diversity of religious and ethnic groups in Indonesia, including religious leaders into the conversation about antibiotic use and antibiotic resistance could potentially lift awareness and improve education about the rational use of antibiotics (43).

New approaches to safeguarding antibiotics

As already indicated by existing literature and research, one of the key components in the fight against antibiotic resistance is the introduction of safeguarding measures to preserve antibiotics for when they are really needed (50). The present study opens new perspectives on current safeguarding procedures as described by one of the study participants. The participant pointed out the possibility that pharmacists should be
allowed to deny distribution of certain lines of antibiotics, even if the patient has a prescription. In order to receive antibiotics, the healthcare professional should attest to the pharmacists that the patient does indeed have a bacterial infection. The participant suggested that one way to attest this is by presenting blood culture results to the pharmacists. This approach is highly debatable, since it would lead to a delay in distributing the medication to the patients because of the time it takes to run a diagnostic test. Moreover, taking into consideration Indonesia’s demographic and geographic profile, conducting a blood culture test for every single patient would be logistically challenging (44). In addition, it needs to be noted that based on the pharmacy education curriculum in Indonesia, pharmacists do not have the specific training to decide whether the patient is allowed to receive antibiotics or not (51). The driving factors for the new stewardship approach are drug availability and accessibility as well as the education of healthcare professionals, such as pharmacists and clinical microbiologists. Furthermore, the habit and behaviour of professionals and patients are likely to change because of the shift of accessibility of antibiotics (see figure 4). Patients are not able to purchase antibiotics as easily as before, because pharmacists would need to assess the blood culture results before dispensation of antibiotics.

**Relationship between actors in the health sector**

The thesis’ findings support characteristics of the Indonesian culture such as the hierarchical social structure and power relationship between people of higher and lower social class and their doctors. The present relationship is known to result in ‘less autonomy’ for patients to make their own decisions, leaving the decision up to the doctor (52,53). In previous studies from Indonesia (54), researchers concluded that theoretically, doctors and patients are in favour of a partnership-style communication, but it is lacking its execution in practice (52). The studies’ results also align with the present findings, namely that the mentioned hierarchical power distance affects the communication among senior and junior healthcare professionals as well, whereby ‘communication on an even level is considered to be highly unusual’ (52). This confirms the present study’s findings in regard to internal trust among healthcare professionals.
One way to counteract the current practice is to establish a familial relationship with patients based on trust and equality, which will facilitate shared decision-making processes and establish trust in the healthcare professional and in the system. This connection can be found in Figure 4, where doctor-patient relationship is directly linked to trust in the system and from there on to trust in healthcare professionals and medicine, as well as trust among healthcare professionals.

**Differences in trust and policy at private and public healthcare facilities**

Due to the introduction of the Universal Health Coverage (UHC) in January 2014, Indonesia faces a tremendous change in private and public healthcare facilities (8). As already indicated by several study participants, public and private healthcare facilities are two different entities with different purposes. Whereas the public sector has to oblige by the set guidelines and standards from the government, the private sector is considered to be rather liberal, not necessarily needing to follow the same guidelines. Should the implementation of UHC in Indonesia be successful in the near future, it needs to be supplemented by campaigns regarding raising awareness about the important role of the public sector and its increasing quality of care. The study participants pointed out that citizens would rather go to private healthcare facilities because they assume that the quality of care and prescribed medication would be better compared to public facilities and therefore justifying the higher costs (55). Previous research on the improvements and expansions of hospitals are in line with the present findings, where patients had little trust in the public sector, leading them to opt for private treatment or even traveling abroad (55). This connection can be observed in Figure 4 through trust in the system and medicine, which is indirectly linked to stakeholder involvement and the policy and guidelines section. Stakeholders in this particular case refer to private, public and governmental bodies.

However, it might be unknown to most of the public that the private sector has liberal regulations, resulting in false assumptions regarding their quality of care and obligation to follow guidelines. Therefore, the UHC should also set in force stricter law enforcement to regulate and harmonize the required guidelines between private and public entities, as well as facilitate prospective opportunities between public-
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Simone Mohrs

private partnerships\textsuperscript{15} to share for example capacity and staff, when public facilities are over capacitated (56).

\textbf{Construction of inverse care law through online and offline media}

The data shows a pattern of inverse care law, a concept which was firstly introduced in 1971 stating that ‘the availability of good medical care tends to vary inversely with the need of the population severed’ (57). Applying this concept to the present study, one can relate this to access to media as well as awareness of antibiotics and their resistance (see figure 4). Since the SUA campaign has primarily taken place online through mailing lists, Twitter and Facebook, only the middle- to high-income population with access to Internet and social media are able to partake in the on-going campaigns and communications. As a result, the lower-income population is not able to access and benefit from the campaign, leaving an even wider gap in education and knowledge about antibiotics and their resistance between the different levels. The lower-income level of society continues to buy antibiotics on the street, without knowing the real impact. Furthermore, if they are going to the doctor, they do not know how to ask the right questions, and may get prescriptions for antibiotics without fulfilling the whole regimen because they have to go back to work. Therefore, it is important to raise awareness of the SUA campaign through offline media channels as well, such as billboards, word of mouth, radio and TV, which are present everywhere in Jakarta and also accessible for the low-income society.

\textbf{Focus on both ends}

Since YOP is focusing on educating patients, primarily young parents and their children, most of the study participant pointed out that there is still the need to educate healthcare professionals. Recent literature aligns with the findings of the present study suggesting that education on the smart use of antibiotics should start in the first year of undergraduate training of healthcare professionals. This approach would involve a high degree of commitment from national stakeholders such as the ministry of education and healthcare professional’s associations as well as agreement on the scope of practices and the skillset that will be required during the professionals’ education (15). In Indonesia, due to its hierarchical cultural structure

\textsuperscript{15} see glossary for definition (6)
(52), it is not enough to educate the patient through educational and awareness campaigns, because once the patients visit the doctor and the doctor prescribes antibiotics, the patient will follow the advice and take antibiotics. Therefore, it is important to educate healthcare professionals and patients equally in order to tackle the irrational use of antibiotics and professionals’ habits of prescribing antibiotics. Figure 4 displays this connection by linking the education of healthcare professionals and patients to stakeholder involvement and doctor-patient relationship.

**Strengths and Limitations**

The following section highlights the study’s strengths and limitations that the researcher encountered during the research process.

Firstly, due to its great variety of stakeholder groups within the participant selection, the researcher was able to encompass a broad spectrum of stakeholders, which are involved in the Smart Use of Antibiotics campaign. Secondly, the identified factors and sub factors of Figure 4 build a comprehensive model that enables the reader to understand their relationship. Thirdly, since the researcher was conducting all of the interviews, loss of data from the interview to the transcript and analysis could be minimized to full extent (58).

Since the supervisor selected the participants based on her contacts in Jakarta, the participant selection might be biased and does not entirely represent the different stakeholder groups of YOP. The supervisor was advised by the researcher to seek out to any possible contact. Therefore, the researcher acknowledges the likelihood that only actively involved participants were interviewed, resulting in a rather homogenous and positive resonance regarding the campaign’s impact. If the interview would have been taken place anonymously through an online forum without the interaction of the supervisor, a different outcome might have seen.

Furthermore, the researcher acknowledges the different literacy levels of study participants in regard to the English level, where some participants had no problem speaking English and others realised during the interview that they should have had a
translator present for the interview\textsuperscript{16}. Another limitation is the choice of the translator. Due to time and money constraints, the researcher could not find or afford to pay a professional translator who was able to speak Bahasa Indonesian for the interview. The translator should also be educated enough to understand the topic of antibiotic resistance in the event that participants explained their thoughts in medical terminology, as well as aware of the Smart Use of Antibiotics campaign. Therefore, the researcher chose to have the supervisor act as the translator. Since both the translator and study participant were made aware of the importance of the interview, the presence of the translator had little to no impact on the quality of the interview (see ethical considerations). During one interview, the translator needed to leave earlier than expected. However, the participant and researcher were made aware of this and another translator, chosen by the researcher, stepped in. Furthermore, two of the participants brought an acquaintance with them to the interview. The researcher explained to the attendees that the other person should not influence the participant in answering the question, which would impact the outcome of the interview.

During the interviews, research participants were asked to identify with a certain stakeholder group, as explained by the researcher. This was considered by the participants to be challenging, since many saw themselves within at least two groups (individual and network level). For the analysis, the researcher used the initial classification, which was done prior to the interviews. Moreover, the researcher was not able to interview any participants from the policy level. This can be reflected as a major drawback for the study, because the majority of the research participants were mentioning the considerably large impact of the policy / government level on the issue of antibiotic resistance. Furthermore, the researcher identified five major factors that can explain the influence of antibiotic use and antibiotic resistance in Jakarta. The researcher acknowledges that there may be more than five factors, however, these where not clearly identifiable throughout the data analysis.

**Conclusion**

Five major factors were identified that could influence the use of antibiotics and knowledge about antibiotic resistance in Jakarta. Additionally, the research stresses

\textsuperscript{16} The researcher asked the participant whether she wanted to quit the interview and schedule another appointment with a translator. The participant declined and the interview continued in English.
the importance of uniting all stakeholders together to address antibiotic resistance from all angles, including the healthcare professional, educational, political, media veterinary and agriculture sector. Further research needs to be done to find methods of how to include religious leaders in the conversation about antibiotic resistance, as well as finding appropriate measures to safeguard antibiotics without compromising the doctors’ authority and to facilitate a culturally appropriate way of communicating between doctors and patients. In addition, the researcher hopes for a promising future regarding the further implementation of the UHC in 2019 and its implication on patients’ trust in the system. Lastly, further research needs to be done to investigate how to bridge the gap between high-, middle- and lower social economic society in regard to inversed care as well as the education of patients and healthcare professionals.
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Annex

Annex 1: How antibiotic resistance occurs

Annex 2: Written Consent Form for Participant

Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta - A qualitative study on the perceptions of stakeholders in YOP campaign in Indonesia

In partnership with: UPPSALA UNIVERSITY
Main investigator: Simone Mohrs

Explanation of the reasons for the survey

My name is Simone Mohrs. I am studying my Master in International Health at the Department of International Mother and Child Health at Uppsala University, Sweden. I am conducting my Master thesis on "factors that influence the use of antibiotic and knowledge about antibiotic resistance in Jakarta."

You are invited to participate in this study, which will be conducted in the city of Jakarta, Indonesia. A total of ten to twelve interviews with stakeholders from the political, social, network, and organisational and individual level will be conducted in this city.

Description of the procedure

I will ask you some questions about your perceived impact of the YOP campaign in the field of rational / smart use of antibiotics and antibiotic resistance in general as a specific stakeholder.

Risks and Discomfort
The interview will take about thirty / forty-five to maximum sixty minutes. There are minimal risks connected to participation in this study. All research projects involve a certain risk, such as the information being known by others than those who are involved in the project. We will do our best to ensure that the information you give us will not be known by anyone else besides us. You have the right not to answer one or more questions and you can ask me not to ask any more questions, if you so desire.

**Benefits**

There are no direct benefits connected to participation in this study. However, the results from this survey may help to improve the YOP and SUA campaign as well as the quality of the Milis Sehat E-Mail list and the Program Edukasi Kesehatan Anak untuk Orang Tua. You will not receive any payment for participating in this study.

**Alternatives**

You are not required to participate in this survey. Participation in this study is completely voluntary and there are no consequences if you decide not to participate.

**Confidentiality**

The information you give me is confidential, which means that, apart from me, no one else will know your answers. A number will identify each participant so that your name is not recognized. During the interview I will ask for your name, but it will be removed when the interview is over. The information I collect from you will be stored in a secure, locked place.

**Rejection to participate or withdrawal without penalty**

The decision to participate or not in this study is yours and there is no problem if you decide not to participate, and you will not lose any benefits already part of programs that reach your community. You have the right to regret your consent to continue and to no longer participating in the survey at any time. You can choose not to answer any question or end the interview at any time.

**Cost of participation**

You will not have to pay to participate in this study.

**Questions**

If you have any questions or comments about the study, please contact the main investigator Simone Mohrs telephone number +46 76-071 77 96, from 9:00 am to 4:00 pm CEST (minus five hours Indonesian time). If you have questions about your rights as a participant in this research project, please contact the Department of
Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta
Simone Mohrs

International Mother and Child Health, Uppsala University, phone number +46 18-50 80 13

**Rights**

If you decide to participate in this study and sign this informed consent, it does not in any way affect your legal rights as an Indonesian citizen.

**Signature**

Your signature or fingerprint below indicates that you have read or have been read the informed consent, that you have understood what is included in the study and that you have agreed to participate. You know that your participation is voluntary and that you may withdrawn at any time during the study, and that a withdrawal from the study will not in any way affect the benefits you already receive from community programs.

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature or fingerprint of the participant</th>
<th>Date</th>
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<table>
<thead>
<tr>
<th>Name</th>
<th>Signature from investigator the receive the consent form</th>
<th>Date</th>
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</table>
Annex 3: Statement by the main researcher / person taking consent

Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta - A qualitative study on the perceptions of stakeholders in YOP campaign in Indonesia

STATEMENT BY THE MAIN RESEARCHER / PERSON TAKING CONSENT

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Print Name of researcher / person taking the consent___________________________

Signature of researcher /person taking the consent

___________________________

Date

___________________________

(Day/month/year)
Annex 4: Interview Guide

Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta - A qualitative study on the perceptions of stakeholders in YOP campaign in Indonesia

Introduction of the interviewer
Thank you for joining me today, I am very happy that you took your time today to help me with my research.

My name is Simone Mohrs, and I would like to interview you today about your perceptions of the possible impact of campaign offered by YOP with regards to rational use of antibiotics and antibiotic resistance.

During the interview, I would like to discuss the following topics with you: your thoughts of the campaign offered by YOP, knowledge about antibiotics and antibiotic resistance, your perception about the overall impact of the campaign, as well as possible factors which might impact antibiotic use of patient

The duration of this interview will approximately take between 30 / 45 to maximum 60 minutes. I will ask you some questions in-between but please feel free just to share your thoughts to me about anything you feel is relevant to the research matter. I will take minor notes as we speak.

Please feel free to express your opinions to me. I would like to stress out that there are no definite, right answers I am looking for; I just want to hear your perception and knowledge / experiences.

Questions

Table 4: Questions for semi-structured interview

<table>
<thead>
<tr>
<th>Main question</th>
<th>Additional question</th>
<th>Clarifying question</th>
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<tbody>
<tr>
<td>How do you see yourself within the project?</td>
<td>Can you explain to me what you think your role is?</td>
<td>Can you expand a little on this? Can you tell me anything else? Can you give me some examples?</td>
</tr>
<tr>
<td>How do you, as a stakeholder in Jakarta, perceive the possible impact of the YOP campaign in regard to smart use of antibiotics and antibiotic</td>
<td>Do you think you are able to identify underlying factors that make you think that there’s an impact, based on your position as a stakeholder?</td>
<td>Can you expand a little on this? Can you tell me anything else? Can you give me some examples?</td>
</tr>
</tbody>
</table>
Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta
Simone Mohrs

| resistance in general? | Do you think you are able to identify factors that influence the antibiotic use by patients / consumers, based on your position as a stakeholder? You might use facilitating and / or hindering factors. For visual help, please see picture below. | examples? |

Altered Framework

![Altered conceptual framework of the Antibiotics Smart Use (ASU) model for interview (16)](image)

Figure 6: Altered conceptual framework of the Antibiotics Smart Use (ASU) model for interview (16)

Closure

I will ask you if you have further questions or comments to the interview, points that we forgot about or should have been addressed and if you want you are allowed to summarize your most important points. You are free to review my notes and suggest changes, in case I got a wrong impression.

De-brief

Once the interview is finished, the investigator will check the recordings, revise the notes and reflect on the strengths and challenges of the interview and note these down as part of personal reflection.
Annex 5: Information Sheet

Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta - A qualitative study on the perceptions of stakeholders in YOP campaign in Indonesia

INFORMATION SHEET

Date: October 2014

Introduction
I am Simone Mohrs, working on my Master Thesis at Uppsala University. I am doing research on antibiotics and antibiotic resistance. I am going to give you information and invite you to be part of this research. You are not bound to a decision today, whether or not you will participate in the research. Before your final decision, please feel free to contact anyone you like to discuss about the research. Next to this information sheet, you will receive a consent form. In case you do not understand any words, please do not hesitate to contact me. I will try my best to explain everything in detail.

Purpose of the research
I am trying to identify factors that influence the use of antibiotic and knowledge about antibiotic resistance in Jakarta. In order to achieve this, I am investigating the different perceptions of stakeholders on the impact of the Smart Use of Antibiotics (SUA) campaign offered by YOP in Jakarta. I am interested to get your opinion as a particular stakeholder, meaning a person, who is able to represent parents perception, political perception, organisational perception (as being a part of the YOP campaign), network level (close collaborator to YOP) or social level such as physicians in general.

Type of Research Intervention
This intervention is based on interviews. Each interview will take about 30 to 45, maximum 60 minutes.

Participant Selection
You are being invited to take part in this research because you have been previously in contact with YOP and are able to reflect your perception as a representative of either political, social, network, organisational or individual (parent).

Voluntary Participation
Your participation in this research is entirely voluntary. Should you change your mind and do not want to participate any longer as a participant; you are free to do so at anytime.

Procedures
During the interview, I will sit down with you in at a location of your choice. No one else but the interviewer will be present unless you prefer to have an interpreter present, who will translate your answers into English. Ideally, the interview will be recorded with two audio recorders. If you do not want to be recorded, please let me know beforehand so I can organize note takers who help me taking notes during the interview so I can fully concentrate on you. Please let us know about the interpreter as well, so I can arrange his / her presence accordingly. The recordings are confidential, and no one else will access to the information documented during or after our interview. The audio-files will be stored on several USB-sticks, all password protected. The recordings will be destroyed after the final presentation of the Master Thesis in end of May 2015.

Duration
I will interview you once for approximately 30 to 60 minutes maximum.

Risks and Benefits
Please refer to the risk section on the consent form. If you have further question about your risk and benefits as a participant, please do not hesitate to contact me.

Reimbursements
You will not be provided any incentive or pay you to take part in the research. However, I will provide you with non-alcoholic refreshments and snacks during the interview.

Confidentiality
I will keep all your information confidential and secure. That means, I will not share any information about you to anyone outside the research team (local supervisor from Jakarta). For the purpose of confidentiality and security I will not use your actual name during my research at any time. Instead I will give you a number that represents
you further in the analysis. The number-name combination, again, will not be shared with anyone else and be stored on a password protected USB-stick.

**Sharing the Results**

Nothing that you tell me (or the interpreter / note taker, in case of presence during the interview) will be shared with anybody else and nothing will be attributed to you by name. The gained knowledge from the interview will be shared with you before publishing any results for the greater public. Each participant will receive a summary of the results.

**Right to Refuse or Withdraw**

In the event that you feel uncomfortable at a certain point during the interview or study phase, you do not have to take part in this research if you do not wish to do so anymore. Your choice of leaving the study will not have any affect on your job or job-related evaluations in any way. After the interview, I will give you’re the opportunity to review my notes and make remarks, if you do not agree or if I misunderstood them.

**Who to Contact**

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact me by email: mohrs.simone@gmail.com

This proposal has been reviewed and approved by Uppsala University, Department of International Mother and Child Health. That Department takes responsibility about any ethical considerations and makes sure that participants like you are protected from any kind of harm related to the research I am about to conduct. If you wish to find about more about them, contact

Department of International Mother and Child Health, Uppsala University, Drottninggatan 4, plan 4, phone number +46 18-50 80 13
Annex 6: Confidentiality agreement

**Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta - A qualitative study on the perceptions of stakeholders in YOP campaign in Indonesia**

1. The Confidential Information to be disclosed can be described as and includes: *Everything the translator heard and transcribed into the document, as well as already existing answers within the transcript.*

2. The Recipient agrees not to disclose the confidential information obtained from the discloser to anyone unless required to do so by law.

3. This Agreement states the entire agreement between the researcher and the translator concerning the disclosure of Confidential Information. Any addition or modification to this Agreement must be made in writing and signed by the parties.

4. If any of the provisions of this Agreement are found to be unenforceable, the remainder shall be enforced as fully as possible and the unenforceable provision(s) shall be deemed modified to the limited extent required to permit enforcement of the Agreement as a whole.

WHEREFORE, the parties acknowledge that they have read and understand this Agreement and voluntarily accept the duties and obligations set forth herein.

Recipient of Confidential Information:
Name (Print or Type): Aries Kurniawan
Signature:  
Date:

Discloser of Confidential Information:
Name (Print or Type): Simone Mohrs
Signature:  
Date:
Annex 7: Statement of supervisor

Name of student: Simone Mohrs (910311-T101 – 910311-8163)
Date of birth: 91-03-11 (11th of March 1991)
Study Program: International Health
Department: International Mother and Child Health Department
Faculty: Faculty of Medicine
University: Uppsala University

Herewith, I, the undersigned, agree to be the local supervisor of the abovementioned student for her study on the stakeholders’ perceptions about the impact of the campaign offered by the Concerned and Caring Parents Foundation (YOP) in rational use of antibiotics and antibiotic resistance in Jakarta.

Please contact me at vida.parady@gmail.com or mobile +62 812 8531 8742 should you have any questions.

Yours sincerely,

[Signature]

Vida A Parady
National Coordinator – Smart Use of Antibiotics Program
Annex 8: Timeframe

Table 5: Timeframe for master thesis

<table>
<thead>
<tr>
<th>Event</th>
<th>Sept 14</th>
<th>Oct 14</th>
<th>Nov 14</th>
<th>Dec 14</th>
<th>Jan 15</th>
<th>Feb 15</th>
<th>Mar 15</th>
<th>Apr 15</th>
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</thead>
<tbody>
<tr>
<td>Approval to conduct a study</td>
<td>01.09</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Identifying group</td>
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<td></td>
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<td></td>
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<tr>
<td>Developing interview questions</td>
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<tr>
<td>Draft of Ethical Application</td>
<td>06.10</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Final study protocol and Ethical application</td>
<td>20.10.</td>
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<tr>
<td>Writing letter of consent to interviewees</td>
<td>21.10.</td>
<td>30.11.</td>
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<tr>
<td>Interviews in Jakarta</td>
<td>06.12</td>
<td>26.12</td>
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<tr>
<td>Transcribing and analysing the data</td>
<td>26.12</td>
<td></td>
<td></td>
<td>31.03</td>
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<tr>
<td>Writing the thesis</td>
<td>01.02.</td>
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<td>30.04.</td>
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<tr>
<td>Submission of the thesis</td>
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<td>30.5.</td>
<td></td>
</tr>
</tbody>
</table>

Annex 9: Budget

This study did not have an external financer. The researcher applied for scholarship funding, however, due to the short application period, the researcher did not meet all application criteria by the end of the application period. Therefore, personal income and saving and parental financing financed the study. The budget of the study project is described in table 6.

Table 6: Estimated budget

<table>
<thead>
<tr>
<th>Type of expenses</th>
<th>Estimated amount in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel expenses between Sweden / Germany and Jakarta</td>
<td>600 EUR</td>
</tr>
<tr>
<td>Travel expenses within Jakarta</td>
<td>30 EUR</td>
</tr>
<tr>
<td>Accommodation in Jakarta</td>
<td>100 EUR</td>
</tr>
</tbody>
</table>
Annex 10: Description of framework

The first part of the framework is included in the top-down approach, whereas *policy and guidelines* have direct impact on *drug availability and accessibility*. If the political sector adapts policies for restricting the access of antibiotics for licensed pharmacists, availability and accessibility of antibiotics will change tremendously. As a consequence of restrictive policies, *habit and behaviour* of patients and healthcare professionals will change, because of the restricted drug availability and accessibility. If antibiotics are not available on the open market or are not easily prescribed by healthcare professionals, both stakeholders would adapt their behaviour accordingly. When patients are not able to access the drugs, the general availability will decrease as well. However this might eventually result in an increased interest in obtaining antibiotics from unauthorized sources (59).

Thirdly, the connection between *habit and behaviour* and *education of patients* as well as *education of healthcare professionals* needs to be explored. Previous research done by YOP has shown that education has a direct impact on the knowledge of antibiotics and its resistance characteristics for patients (31). It is assumed that educated patients are more likely to engage in a more rational use of antibiotics, being able to make informed choices whether or not to give antibiotics to their children. They are also less likely to frequent hospital visits, compared to uneducated parents. Furthermore, the habit and behaviour of healthcare professionals is also connected to their education. It was stated during an interview that doctors should attend educational courses throughout their career to refresh existing knowledge, also to adapt to the latest practices. If healthcare professionals would receive more education, their prescribing methods [*behaviour*] will change as well, indirectly influencing the education of the patients.

Fourthly, the link between *habit and behaviour* to *trust in the system* needs to be discussed. If the population, patients and professionals, believe in the system, behaviour and habit will change. Patient and professionals will trust the system, meaning that if the government decides to set up certain regulations, which are in the best interest for the patients and professionals, both parties will be more likely to
follow the guidelines. The patient will not purchase antibiotics illegally and the healthcare professional will not prescribe antibiotics for virus infections. *Habit and behaviour* have an impact through the *educational factor* of both patient and healthcare professional. In the event that patients and professionals become educated in a sense that it changes their behaviour regarding to antibiotic use and their knowledge of antibiotic resistance, they are more likely to *trust the system*. It has to be noted that trust in the system is easier to gain, if the system is acting within its legal framework and taking all policies into consideration.

In addition to habit and behaviour, *trust in the system* is also shaped by two cultural factors, namely *doctor-patient relationship* and *environment / surrounding*. In Indonesia, the doctor-patient relationship is very hierarchical, whereby the doctor is seen as superior to the patient. The doctor is holding all the information and the patient receives the information. They are not considered to be on the same level, thus impacting the trust in the system. Nevertheless, *policy and guidelines* can influence the doctor-patient relationship through implementing patient friendly and empowering policies, levelling the doctors’ and patients’ relationship. Another influencing factor is the *stakeholder involvement*. If certain stakeholder groups become involved in the smart use of antibiotics campaign, they will have indirect impact in the doctor-patient relationship i.e. through providing information for doctors and patients. According to the participants, the private sector can be describe as very liberal in obliging to guidelines, with a high rate on irrational prescriptions of antibiotics.

The second factor is the *environment / surrounding* factor. This factor encompasses the environment of the patients and that of healthcare professionals. If the patient lives in an environment that believes in the concept of smart use of antibiotics and practices rational use of medicine, the patient is more likely to engage in the same way and thus trust the system more. If people who don’t believe in the smart use of antibiotics surround the patient, he or she will most likely act the same way and distrust the system. For healthcare professionals, the daily practice and contact with colleagues is seen as environment and surrounding. Professionals, who are surrounded by likeminded colleagues are more prone to practice according to what they have been taught at university and prescribe antibiotics rightfully. In addition, *policy and guidelines* as well as *stakeholder involvement* will indirectly impact the
surrounding and environment of patients and healthcare professionals. Policies can be a steering factor for the environment of both parties, guiding doctors towards rational prescribing habits and patients towards rational use of antibiotics due to restricted access. Involvement of certain stakeholders can impact the environment as well, helping patients to decide what to do in certain situation and helping healthcare professionals to perform effectively and efficiently.

The next part in-cooperates a clear bottom up approach, starting with stakeholder involvement, awareness of patients and healthcare professionals and trust in medicine, healthcare professionals and internal trust among healthcare professionals.

*Stakeholder involvement* includes parties from inter alia the medical, educational and social media field. Stakeholders from the medical field include pharmacists, public health, medicine, nurses, which could help raising the importance of antibiotic resistance and antibiotics in general in their daily life and practice. Education includes the ministry of education that helps to facilitate the update of antibiotic and its resistance in school curriculum from an early age. Stakeholders that are involved in social media are also seen as important actors for spreading information to professionals and patients. In general, stakeholders have a great impact on *policy and guidelines*, since they are the one’s, who are able to shape policy outputs and ability to spread information to other relevant stakeholders. As an example, the ministry of education is able to set up new education curriculums for school children, influencing the education of patients, whereas the stakeholders from the medical field can serve with their scientific and practice related expertise, lastly impacting all other factors of the framework. In addition, increase *stakeholder involvement* can increase the *awareness of patients and healthcare professionals*. As described previously, the more stakeholders involved in spreading information and sharing expertise, implementing and advocating smart use of antibiotics, the more likely it is to raise awareness and attention of patients and professionals. Nevertheless, change needs to be more or less simultaneous in each sector and in-between them. As example, if one pharmacist abiding by these new policies implied by the Ministry of health while the pharmacy around the corner will still be willing to sell AB-pills over the counter, the change will most certainly not succeed from a long-term approach.
Factors influencing the use of antibiotics and knowledge about antibiotic resistance in Jakarta
Simone Mohrs

Awareness of patients can lead to a more trusting environment concerning the trust in medicine and trust in healthcare professionals. If patients are more aware of the practices in the area of antibiotics and its resistance, they are more likely to gain trust in medicine, for example taking the whole regimen of antibiotics and trust in the effect of non-antibiotic medication for viral infections etc. Furthermore, increased awareness of patient might impact their trust in the healthcare professionals. If the patient is aware of the possible impact of antibiotics, the patient is more likely to openly talk with the healthcare professional, giving the doctor greater possibility to provide better service and consultations to the patient.

Awareness of healthcare professionals is linked to internal trust among the healthcare professionals. The internal trust among health professionals is mainly explained through trust of younger doctors towards senior doctors. The data has shown that younger doctors trust senior doctors in their prescribing habits and healthcare related behaviour in a sense that the senior has probably more experience and knows what he or she is doing. Therefore, younger professionals rather obey older doctors and try to imitate their behaviour. This can have positive or negative outcomes. Positive outcome: The senior doctor is doing everything correct, being a great role model for young doctors and keeps up to date with the latest research practices. Negative outcome: The senior doctor does not adapt to the changing environment and continues his / her practices like the past thirty to forty years, being a bad role model to the younger doctors. However, young doctors have very high respect towards older doctors, which hinders them to speak up against the senior doctors, leading to a vicious cycle, as they become senior doctors later on. All three trust categories consequently leading to trust in the system.

Online and offline media have the ability to influence all above-mentioned factors. The researcher differentiated between online and offline due its variation in target group reach. Online media is mainly used by people from the middle to higher-economic society, who are able to access Internet and able to engage through social media. Online media requires the user to be pro-active, sharing information in networks, reading latest news and engage in online-forum discussions. Offline media on the other hand is mainly used for the strata of society, who are not able to access Internet, relying on print media, radio or television. This way is rather passive, as its
only provides information but no interaction between information provider and receiver. Media is used to raise awareness of patients and healthcare professionals, spreading news about the smart use of antibiotics and antibiotic resistance. Furthermore it influences the trust in medicine and healthcare professionals, as it can provide a platform for professionals and patients to communicate freely towards a better doctor-patient relationship. In addition, it improves the patient’s environment and surrounding and is able to facilitate the uptake of information and serve as an educational tool for patients and professionals and thus influence their habit and behaviour.