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## Tables, Figures, Abbreviations and Acronyms

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### Abbreviations and Acronyms

- **BLK**: Balai Laboratorium Kesehatan
- **BMI**: Body Mass Index
- **DMFT or dmf**: Decayed, Missing, Filled Teeth (permanent/deciduous)
- **FKG UNPAD**: Facultas Kedokteran Gigi, Universitas Padjadjaran (Padjadjaran University Faculty of Dentistry)
- **GIZ**: Deutsche Gesellschaft für Internationale Zusammenarbeit
- **HFA**: Height-for-Age
- **HOS**: Health Outcome Study
- **LabKes**: Laboratorium Kesehatan
- **MDA**: Mass drug administration
- **MoEC**: Ministry of Education and Culture
- **MoH**: Ministry of Health
- **PEO**: Provincial Education Office
- **PUFA or pufa**: Pulp involvement, Ulceration, Fistula, Abscess (permanent/deciduous)
- **SEAMEO-INNOTECH**: Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology
- **STH**: Soil-transmitted Helminth
- **TP UKS**: Tim Pembina Usaha Kesehatan Sekolah (School Health Program Team)
- **UNESCO**: United Nations Educational, Scientific and Cultural Organization
- **UNICEF**: United Nations Children's Fund
- **WHO**: World Health Organization
In the Republic of Indonesia, the world’s largest archipelago, and the world’s fourth most populous country, the prevalence of infectious diseases, including soil-transmitted helminths and odontogenic infections among the elementary school population is high and data shows that there is a complexity of health problems in school age children. To help address this issue, the Provincial Education Office (PEO) of West Java, the Southeast Asian Ministers of Education Organization Regional Center for Educational Innovation and Technology (SEAMEO INNOTECH), and the German Organisation for International Cooperation [Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH] have partnered to implement a school health program based on the Fit for School Approach - an internationally award-winning integrated concept developed in the Philippines. The program consists of three interventions: 1) daily handwashing with soap as a group activity, 2) daily toothbrushing with fluoride toothpaste as a group activity, and 3) biannual mass deworming according to the guidelines of the World Health Organization (WHO). Currently, the program is being implemented in pilot public elementary schools in the province of West Java, specifically in the City of Bandung and the District of Indramayu, covering around 7,000 elementary school children.

To assess program impact, a Health Outcome Study (HOS) is an essential activity of the research and development component of the program. The study is a longitudinal clustered controlled trial that aims to determine the effects of the program interventions on health status and school attendance of six to seven-year old public primary school students in Indonesia in nine intervention and nine the same number of control schools. Specifically, the study looks at nutritional status, parasitological status, oral health status, prevalence of mouth and abdominal pain, school attendance as well as socio-demographic information. It is part of a bigger regional study using a similar research protocol in Cambodia, Lao PDR and the Philippines.

A total of 579 children participated in the baseline survey, 286 from the intervention schools and 293 from control schools. Each child was assessed for weight, height, infection with any of the soil-transmitted helminths (STH), caries experience, odontogenic infection, and oral and abdominal pain.

Around 15% of the children showed a low height-for-age with a higher proportion in control schools (18.5%) than in intervention schools (10.5%). Around 30% were found to have below normal BMI for their age also with a higher proportion in control schools (32.5%) than in intervention schools (26.3%).

The prevalence of infection with at least one STH was 2.1%, with 1.2% prevalence of Trichuris infection, 0.8% prevalence of Ascaris infection, and no observed hookworm infection. The prevalence of STH infection in control schools (2.9%) was more than twice the prevalence in intervention schools (1.3%).

Almost all children had caries (95.9%) and the majority had an odontogenic infection (77.0%). On average, the surveyed children had tooth decay in eight to nine primary teeth based on a dmft (decayed, missing, filled teeth) index of 8.3, and odontogenic infection in three to four primary teeth measured through the pufa (pulp involvement, ulceration, fistula, and abscess) index of 3.2. Of the permanent teeth examined, on average, 0.2 teeth per child were found to have caries and none with infection based on mean DMFT and PUFA scores.

Overall, these results mirror findings of other studies and underscore the high burden of oral disease affecting the majority of school children in Indonesia. Despite the prevalence of dental caries and odontogenic infection, less than a fifth of the surveyed students reported having oral problems (13.3%) and 9.2% had abdominal pain at the time of the survey. The prevalence of self-reported mouth problems was similar in the intervention (12.2%) and the control (14.3%) schools, while the prevalence of self-reported abdominal pain was slightly higher in the control schools (11.0% vs. 7.4% respectively).

A follow-up survey involving the same respondents will be conducted 24 months after the baseline to determine if there are significant improvements in the health status of children from intervention schools compared to those from control schools. Further analysis of the
baseline data may help to identify regional variations of health states and correlations between variables. Yet, these baseline results clearly highlight the need for scaling-up effective interventions to address the burden of preventable child diseases and will help to improve advocacy efforts in this context.
1. Background and Introduction

Country Background

The Republic of Indonesia is the world’s largest archipelago, with more than 17,500 islands that are scattered over 1.9 million square kilometers. Indonesia is the world’s fourth most populous country, with an estimated population of 242,325,638 in 2011. One of the five major islands of Indonesia is Java with a total area of 132,107 km² and one of the country’s most populated provinces - West Java – based on the 2010 census. Extreme poverty has been reduced from 20.6% of the population in 1990 to 5.9% in 2008.

In Indonesia, the prevalence of malnutrition, soil-transmitted helminthic and odontogenic infections in the school population are of concern. Due to chronic malnutrition, about a third of the child population suffers from stunting, and 10.9% of boys and 8.3% of girls aged 6-14 years were found to be underweight in West Java province. The 2002-2009 soil-transmitted helminth (STH) infection survey conducted by the Ministry of Health and encompassing 398 public/religious schools in 33 provinces, found that 31.8% of elementary school children suffer from STH infections. According to a WHO SEARO report in 2008, 86% of 6-year old children in Indonesia have dental caries.

Though all of these diseases may not be life-threatening they have a huge impact on the physical and mental development of children, their school attendance, productivity and quality of life. Worm infections can cause anemia, reduced physical growth, delayed development of motor skills, and poor mental development. Already malnourished children become even more malnourished. Furthermore, children who suffer from toothache can have difficulty in eating, sleeping, and concentrating.

These disease conditions are strongly associated with poverty. Poor living conditions, overcrowded classrooms, lack of water, poor sanitation facilities at home, as well as in school, and insufficient healthy food are among the root causes that trap children in the cycle of poverty. However, all these diseases can be prevented and controlled through relatively simple, evidence-based, and cost-effective interventions.
The Fit for School Program

The Provincial Education Office (PEO) of West Java, SEAMEO INNOTECH, and the German Organization for International Cooperation [Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH] have partnered to implement a school health program based on the Fit for School Approach - an internationally award-winning integrated approach developed in the Philippines. The program consists of three interventions:

- daily handwashing with soap as a group activity,
- daily toothbrushing with fluoride toothpaste as a group activity
- biannual mass deworming according to the guidelines of the World Health Organization (WHO).

This program is currently being implemented in selected public elementary schools in Bandung City and Indramayu district, reaching about 7,000 elementary school children. The cornerstone of the program is an intersectoral strategy that uses schools as venues to reach the child population with simple evidence-based preventive interventions. All interventions of the program have demonstrated their positive effects on the health status of children in numerous studies.\textsuperscript{5-8} An assessment of the impact in Indonesia will be conducted through a health outcome study on the Fit for School Program implementation in selected schools. The study is part of a bigger regional study involving Cambodia, Lao PDR, and the Philippines where similar programs are implemented and monitored according to a common research protocol.

Objectives of the Health Outcome Study

The Health Outcome Study (HOS) of the Fit for School Program is a survey that aims to determine the effects of school-based program interventions on health and school attendance of public elementary students in Indonesia, and provide evidence for informed program management. Specifically, the study examines:

- Nutritional status
- Parasitological status
- Oral health status
- Prevalence of oral and abdominal pain
- School attendance

Demonstrating the positive health impact of the Fit for School Program will provide essential arguments for advocacy to stakeholders for sustaining the program and scaling-up. The study can also contribute to increasing the body of evidence and scientific literature on health interventions in the Indonesian context, which is currently very limited regarding integrated school-based health programs.

Indonesian schoolchildren incorporate washing and toothbrushing into their daily routine.
2. Study Materials and Methods

Study Design

The study is a longitudinal clustered controlled trial, which involves the implementation of program interventions in nine public primary schools – the intervention schools. Another nine public primary schools that will not implement the Fit for School Program serve as control schools. The general methodology used is largely following the protocol of the Philippine Fit for School Health Outcome Study.10

The study received ethical clearance from the Health Research Ethics Committee, Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia, and is registered with the German Clinical Trials Register maintained by the University of Freiburg (DRKS-ID: DRKS00004486).

Selection of Intervention and Control Schools

The distribution of schools across the four Vientiane districts are shown in Table 1 and a list of the schools is provided in Annex 1.

Intervention schools were selected based on accessibility, safety, school size, and support from the school administration. Children in intervention schools apply daily handwashing with soap and daily fluoride toothbrushing with 0.3 ml of toothpaste (containing 1,450 ppm of free available fluoride) as group activities, and receive a single dose of albendazole (400mg tablet) as part of a mass drug administration (MDA) campaign against STH, based on recommendations of the World Health Organization. For each intervention school, another school located nearby with similar parameters (e.g. size, socioeconomic background of enrolled children) was assigned as a control school. Children in control schools continue to receive the regular health education programs of the government which, despite a defined policy to promote healthy environments in schools, remain largely focused on a series of lessons in the curriculum.
In preparation for the baseline survey, two teams of local researchers from partner institutions were formed. Each team included representatives from the Faculty of Dentistry - University of Padjadjaran (FKG UNPAD), West Java School Health Team (TP UKS), Bandung City Health Office, and Indramayu District Health Office. All researchers underwent three days of training on data collection methods. To ensure consistency of assessment among researchers, height and weight measurement, and the oral examination technique were calibrated with those of experienced researchers and a WHO consultant on oral health survey methods during the training exercise.

Representatives from both teams conducted orientation sessions with parents and teachers on the correct stool specimen collection technique and distributed stool specimen cups in preparation for the stool examination of participating children.

A two-day refresher course on STH diagnosis using the standard Kato Katz kit was conducted by a senior pathologist for microscopists from the West Java Provincial Health Laboratory (BLK) and Indramayu District Health Laboratory (LabKes) who participated in the survey.

The distribution of participating schools across the two areas in West Java Province is shown in Table 1 below and a list of the schools is provided in Annex 1.

<table>
<thead>
<tr>
<th>School Group</th>
<th>City of Bandung</th>
<th>Indramayu District</th>
<th>No. of Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Control</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>No. of schools</td>
<td>8</td>
<td>10</td>
<td>18</td>
</tr>
</tbody>
</table>

**Study Population and Sample Size**

**Study population:** The assessment focuses on six- to seven-year old grade 1 children enrolled in the intervention and controls schools at the time of the baseline evaluation (September 2012). The same children will undergo a follow-up assessment after 24 months.

**Sample size:** The target number of children was calculated as 600, with 300 from intervention and 300 from control schools. This number was increased to 720 (360 students in each group) to cover for an estimated drop-out rate of 20%. The sample size was based upon detecting a 20% difference in mean caries increment between intervention and control schools after a 24 month period (with power of 80% and significance level of 5%). This would also provide adequate power to detect a 15% decrease in the proportion of children with a defined indicator e.g. those of low BMI, with caries, or with helminth infection.

In each school, 40 children were randomly selected from the list of enrolled Grade 1 students who were six or seven years old at the time of the baseline survey. Consent for their participation was secured from the parents or guardians by school representatives. Children with no parental or guardian consent, or who had a systemic or chronic infection were excluded from the study.

In preparation for the baseline survey, two teams of local researchers from partner institutions were formed. Each team included representatives from the Faculty of Dentistry - University of Padjadjaran (FKG UNPAD), West Java School Health Team (TP UKS), Bandung City Health Office, and Indramayu District Health Office.

All researchers underwent three days of training on data collection methods. To ensure consistency of assessment among researchers, height and weight measurement, and the oral examination technique were calibrated with those of experienced researchers and a WHO consultant on oral health survey methods during the training exercise.

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A two-day refresher course on STH diagnosis using the standard Kato Katz kit was conducted by a senior pathologist for microscopists from the West Java Provincial Health Laboratory (BLK) and Indramayu District Health Laboratory (LabKes) who participated in the survey.
Data Collection

Baseline data collection took place on the school grounds.

- **Registration and stool collection.** The survey began with identification of children and labeling of submitted stool specimens. General information including name, birthdate, and gender were recorded in the standard survey form. A few socio-economic indicators were collected, such as the number of siblings and family ownership of a television set.

- **Anthropometric measurement.** Weight and height measurement followed standards described by Cogill. Weight was measured to the nearest 0.1 kilogram (kg) using a SECA digital weighing scale. Children were instructed to remove shoes, heavy clothing, and objects before stepping on the scale. Every scale was calibrated with a five-kilogram weight at the start of data collection in each school and then after every 5th child thereafter. Height was measured using a microtoise. Children, with their shoes removed, were asked to stand with their backs against the wall where the microtoise was mounted and height was measured to the nearest 0.1 centimeter (cm).

- **Oral Examination.** For the oral examination, children first brushed their teeth to remove food debris. As much as possible the examinations were performed in the school yard with sunlight as a direct light source, otherwise the examinations were done in a room designated by the school head. The children were placed in a supine position on a long classroom bench, table or series of chairs, with their heads on a pillow on the lap of the examiner, who sat behind them. A ball-end probe and disposable mouth mirror with illumination were used as examination tools to score caries and oral infection according to procedures defined by WHO methodology for oral health surveys, as well as Monse, et. al.
Interview on oral and stomach pain. Children were also asked by a trained interviewer if they had oral or abdominal pain at the time of the interview.

Survey forms were examined onsite to check completeness of the recorded information. A sample of the survey form is presented in Annex 2. Children with incomplete information returned to the corresponding survey station to complete the data collection process. Ten per cent of the surveyed children in each school were randomly pre-determined to undergo the examination a second time to assess quality and consistency of data collected by the same or a different examiner.

Parasitologic examination. Stool specimens collected in the school visit and were brought to the laboratory within the same day. Specimens from Bandung schools were brought to BLK for processing and examination, while those from Indramyu schools were brought to LabKes to determine presence of infection with any of the three soil-transmitted helminths (STH; Ascaris species, hookworm and Trichuris species) using the standard Kato Katz technique according to the WHO Bench Aids for the Diagnosis of Intestinal Parasites. A standard Kato Katz cellophane thick smear kit and report template was provided to the laboratory examiners. Ten per cent of stool samples were re-examined by a senior parasitologist for quality control purposes.

Data to measure absenteeism will be collected at the end of the current school year (2012-2013) by checking attendance reflected in school records.

Data Analysis

Raw data was encoded separately by two different encoders and then cross-checked by a data manager for completeness and consistency.

Descriptive statistical analysis was done using STATA software (version 12.1) for all indicators presented in Table 2 with the exception of height-for-age (HFA). The latter was computed using WHO AnthroPlus Software. BMI-for-age was calculated according to the methods of Cole and colleagues. The operational definitions of these indicators are found in Annex 3 of the report.

<table>
<thead>
<tr>
<th>Table 2. Main Survey Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio economic status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Nutritional status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Parasitologic status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Oral health status</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Prevalence of oral and abdominal pain</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
| **School attendance**         | Absenteeism (number of days absent)

1 Absenteeism rate will be determined after completion of classes for school year 2012-2013.
3. Study Results

Demographic Indicators

A total of 579 children participated in this baseline survey – 286 from the intervention schools and 293 from the control schools. The proportion of males in the control group (54.3%) was just slightly higher than that of the intervention group (49.7%). The average age of the survey participants was 6.8 years, and similar in both, intervention and control schools (Table 3).

<table>
<thead>
<tr>
<th>Table 3. Number and average age of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>No. of students (%)</td>
</tr>
<tr>
<td>Ave. age (yrs.)</td>
</tr>
</tbody>
</table>

Socio-economic Indicators

A large proportion of children reported that they have TV at home. TV ownership was noted by 99% of intervention school and 96.9% of control school children. The average number of siblings was two for both intervention and control school children, ranging from 0 to 10 (Table 4).

<table>
<thead>
<tr>
<th>Table 4. Socio-economic background of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Group</td>
</tr>
<tr>
<td>Intervention (n=285)</td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

1 student from the intervention group had missing data on TV ownership.
Nutritional Status Indicators

The mean height of the children was 115.3 cm (Table 5). Children from intervention schools were slightly taller than children from control schools (mean height 116.1 cm vs. 114.5 cm, resp.) and males were slightly taller than females (115.7 cm vs. 114.8 cm).

According to WHO HFA standards, majority (85.5%) of the children examined were found to be within normal range. However, 13.1% showed stunting and 1.4% severe stunting. The proportion of children with stunting was higher in the control schools than in intervention schools (17.1% vs. 9.1%, resp.), while the same proportion (1.4%) in the two school groups had severe stunting. A higher proportion of males had low HFA compared among females (16.3% vs. 12.6%, resp.). Figure 1 shows the

<table>
<thead>
<tr>
<th>School Group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention (n=286)</td>
<td>116.5</td>
<td>115.8</td>
<td>116.1</td>
</tr>
<tr>
<td>Control (n=293)</td>
<td>115.1</td>
<td>113.8</td>
<td>114.5</td>
</tr>
<tr>
<td>Total (n=579)</td>
<td>115.7</td>
<td>114.8</td>
<td>115.3</td>
</tr>
</tbody>
</table>

Note: n(intervention)=286; n(control)=293

HFA distribution of children by type of school and sex. None of the children were considered as “very tall” for their age using the WHO categories.
The mean BMI of children in intervention schools was slightly higher than that from the control schools (15.6 vs. 15.0, resp.), and among males compared to females (15.4 vs. 15.1, resp., Table 6). However, interpreting the BMI of children needs to take account of their age as further described below.

Following the categories used by Cole and colleagues (15, 16) and the International Obesity Task Force, 29.4% of the surveyed children were found to have below normal BMI for their age, with a higher proportion in control than in intervention schools (32.5% vs. 26.3%, resp.) and among females compared to males (32% vs. 27%, resp.); the gender difference is more prominent in the intervention school group.

Above normal BMI-for-age was observed in 11.9% of all children, with 6.2% being overweight and 5.7% being obese; the proportion in the intervention schools was more than double that in control schools (16.7% vs. 7.2%, resp.) (Figure 2).

It was noted that the proportion of surveyed children with below normal BMI was higher in the District

| Table 6. Mean BMI of students (in kg/m²), according to sex |
|---------------------------------|----------|----------|----------|
| School Group                  | Male     | Female   | Total    |
| Intervention (n=286)          | 15.8     | 15.5     | 15.6     |
| Control (n=293)               | 15.1     | 14.8     | 15.0     |
| Total (N=579)                 | 15.4     | 15.1     | 15.3     |

Note: n(intervention)=286; n(control)=293
Soil-Transmitted Helminths

Not all students were able to submit a stool specimen during the baseline survey - only 482 (83.2%) submitted samples for examination. The prevalence of infection with at least one STH was 2.1% as indicated in Figure 3. Children were infected with *Trichuris* spp. (1.2%) and *Ascaris* spp. (0.8%). There were no reported hookworm infections. The prevalence of STH infection was found to be similar in the two survey areas: 2.1% in the City of Bandung and 2.0% in the District of Indramayu.

The prevalence of STH infection in control schools was more than double that in intervention schools (2.9% vs. 1.3% resp.). The same observation was true for species-specific prevalence (Figure 2). The prevalence of heavy infection for both species was less than 1%.
Oral Health Indicators

Almost all children had caries (95.9%) and the majority was affected by an odontogenic infection (77.0%). As presented in Figure 4, both indicators were found to be higher in control schools than in intervention schools; for tooth decay, 98.3% versus 93.4%, respectively; and for odontogenic infections, 82.6% versus 71.3%, respectively. In both, the City of Bandung and District of Indramayu, caries prevalence was noted at 96% while prevalence of odontogenic infection was slightly higher in the District of Indramayu (78.7%) than in the City of Bandung (75.1%).

Number of decayed, missing and filled teeth (dmft/DMFT) and teeth with pulp involvement, ulceration, fistula and abscess (pufa/PUFA) indices for deciduous and permanent teeth. On average, the surveyed children had tooth decay in eight primary teeth based on the dmft index of 8.3 and infections in three primary teeth measured through the pufa index score of 3.2.

As for the permanent teeth, the mean DMFT was noted at 0.2, indicating that children, on average, have zero to one permanent tooth affected by caries. No odontogenic infection of permanent teeth was noted among the surveyed children. The low measures of indices for permanent teeth are not unexpected among the study samples since permanent teeth can still be relatively few among children within the age range of six to seven years (Table 7).

Oral and Abdominal Pain Experience

Less than a fifth of the surveyed students reported to have oral problems (13.3%) or abdominal pain (9.2%) during the time of the survey. The prevalence of self-reported mouth problems during the time of the survey was similar in the intervention (12.2%) and in the control (14.3%) schools. On the other hand, the prevalence of self-reported abdominal pain was slightly higher in the control than in the intervention schools (11.0% vs. 7.4% resp.).

<table>
<thead>
<tr>
<th>Indices</th>
<th>Dentition</th>
<th>Intervention</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean dmft</td>
<td>Primary</td>
<td>8.1</td>
<td>8.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Mean DMFT</td>
<td>Permanent</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Mean pufa</td>
<td>Primary</td>
<td>2.8</td>
<td>3.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Mean PUFA</td>
<td>Permanent</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: n(intervention)=286; n(control)=293
4. Discussion, Conclusion and Outlook

Discussion

This survey provides the baseline results of nutritional, STH and oral health indicators for six—seven year old school children in 18 selected public primary schools in West Java, Indonesia. Half of the schools are conducting the Fit for School Program while the other half serve as control schools implementing the standard governmental school health program.

Nutritional status

Undernutrition is a recognized issue in Indonesia. In this survey the prevalence of stunting was found to be 14.5%, while 29.4% of children were thin (low BMI-for-age). Percentages of children categorized as overweight and obese amounted to 11.9%. In 2010, the WHO Nutrition Landscape Information System indicated that among children under five years of age in Indonesia, the prevalence of stunting was 39.2%, for underweight 18.6%, and for overweight 12.3%. The difference between the findings of the present study and the data in the WHO database could be explained by the different age groups that are covered and the fact that the WHO system has national coverage and includes all urban and rural areas. Nevertheless, it is clear that malnutrition is a serious problem affecting children in the study. Malnutrition needs to be addressed as it can lead to poor growth, impair general development, and negatively affects the child’s cognitive capacity.

Soil-transmitted helminth infections

The prevalence of STH infection among the children examined in this study was 2.1%. Specifically, the prevalence of infection with *Trichuris* spp. was 1.2%, 0.8% for *Ascaris* spp., and no hookworm infection was found. A study conducted by Uga et al. in 2002 in the District of Bekasi in West Java revealed a similar pattern. In that study, few students had STH infection with the highest prevalence noted for *Trichuris* at 8%, and no hookworm infection was present. The low prevalence of STH infection may be partly explained by large scale control programs that are reported to have successfully reduced the prevalence levels to less than 30% in some areas. Further, a recent report (22) has described that areas near the City of Bandung and the District of Indramayu have low STH prevalence. For example, while the prevalence of STH in the District of Indramayu was 2.0% in the current survey, the report notes that the prevalence in surrounding districts was 9.7% in Cirebon in 2011 and 8.7% in Sumedang in 2008. As for the City of Bandung (STH prevalence...
Further investigation of the baseline data may help to identify local variations of health states and correlations between variables. For example, the proportion of thin children was higher in the District of Indramayu than in the City of Bandung. However, the study was not designed for such in-depth analysis, and such investigations may serve to indicate where problems might exist that will require further study.

Lastly, the research activity also provided an opportunity to enhance research capability and cooperation between the education and health sectors, and the academe. Improved research capacity is expected to benefit these organizations in terms of policy and program evaluation, and encourage development and implementation of evidenced-based health interventions in the school setting by bridging theory and practice.

Conclusion and Outlook

This baseline survey showed that roughly a third of six to seven-year old students from selected public primary schools suffered from acute and chronic malnutrition, and few were infected with at least one of the soil-transmitted helminths. Almost all children had dental caries, with the majority having concurrent odontogenic infection. A follow-up study will be conducted after two years to assess the impact of the Fit for School Program interventions on these indicators.

It is crucial to use the baseline results in further advocacy to highlight the widely neglected and socially accepted negative health conditions of children in Indonesia which impact greatly on their health and development. Clear and understandable communication of the results and presentation to decision makers will help to establish and sustain commitment for long-term support of effective school health interventions.
5. References


Annexes
Annex 1: List of Schools Surveyed by the Research Teams

Research Team 1

1. Kota Bandung

<table>
<thead>
<tr>
<th>School Name</th>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sekolah Dasar Percobaan Negri Sabang</td>
<td>Intervention</td>
<td>September 25, 2012</td>
</tr>
<tr>
<td>SD Kresna</td>
<td>Intervention</td>
<td>September 26, 2012</td>
</tr>
<tr>
<td>MI Miftahul</td>
<td>Control</td>
<td>September 24, 2012</td>
</tr>
<tr>
<td>SDN Leuwianyar</td>
<td>Control</td>
<td>September 28, 2012</td>
</tr>
</tbody>
</table>

2. Kabupaten Indramayu

<table>
<thead>
<tr>
<th>School Name</th>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD Margadadi 4</td>
<td>Intervention</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>SD Margadadi 6</td>
<td>Intervention</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>Persatuan Umat Islam (PUI) Sindang</td>
<td>Intervention</td>
<td>October 3, 2012</td>
</tr>
<tr>
<td>SDN Margadadi 1</td>
<td>Control</td>
<td>October 2, 2012</td>
</tr>
<tr>
<td>SDN Margadadi 8</td>
<td>Control</td>
<td>October 2, 2012</td>
</tr>
</tbody>
</table>

Research Team 2

1. Kota Bandung

<table>
<thead>
<tr>
<th>School Name</th>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN Margasari</td>
<td>Intervention</td>
<td>September 24, 2012</td>
</tr>
<tr>
<td>SD Leuwipanjang</td>
<td>Intervention</td>
<td>September 28, 2012</td>
</tr>
<tr>
<td>SDN Ciujung</td>
<td>Control</td>
<td>September 25, 2012</td>
</tr>
<tr>
<td>SDN Ayudia</td>
<td>Control</td>
<td>September 26, 2012</td>
</tr>
</tbody>
</table>

2. Kabupaten Indramayu

<table>
<thead>
<tr>
<th>School Name</th>
<th>Type</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD Margadadi 5</td>
<td>Intervention</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>SD Margadadi 7</td>
<td>Intervention</td>
<td>October 1, 2012</td>
</tr>
<tr>
<td>SDN Margadadi 2</td>
<td>Control</td>
<td>October 2, 2012</td>
</tr>
<tr>
<td>SDN Margadadi 3</td>
<td>Control</td>
<td>October 2, 2012</td>
</tr>
<tr>
<td>SDN Dermayu8</td>
<td>Control</td>
<td>October 3, 2012</td>
</tr>
</tbody>
</table>
**Annex 2: Survey Assessment Form**

**Unique ID:** 221-001  
**Name:** __________________________________________________________________

**HEALTH OUTCOME SURVEY ASSESSMENT FORM**

<table>
<thead>
<tr>
<th>Duplicate:</th>
<th>Yes</th>
<th>No</th>
<th>Date: mm/dd/yyyy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Personal Information**  
Examiner ID: ___  
Birth date: mm/dd/yyyy  
Days absent during the last school year: ___  
Gender:  ♂ Male  ⬤ Female

**Anthropometric Data**  
Examiner ID: ___  
Weight: __. __ kg.  Height: __. ___ cm.

**Dentition Status**  
Recorder ID: _______  
Examiner ID: _____

<table>
<thead>
<tr>
<th>Permanent Tooth</th>
<th>Status</th>
<th>Primary Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sound</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>Decayed</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>Filled, with decay</td>
<td>C</td>
</tr>
<tr>
<td>3</td>
<td>Filled, no decay</td>
<td>D</td>
</tr>
<tr>
<td>4</td>
<td>Missing, due to carries</td>
<td>E</td>
</tr>
<tr>
<td>5</td>
<td>Missing, any other reason</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Sealant, varnish</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>Pulp involvement</td>
<td>G</td>
</tr>
<tr>
<td>8</td>
<td>Un-erupted tooth</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Not Recorded</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permanent Tooth</th>
<th>Status</th>
<th>Primary Teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Open Pulp in permanent dentition</td>
<td>p</td>
</tr>
<tr>
<td>2</td>
<td>Traumatic Ulceration in permanent dentition</td>
<td>u</td>
</tr>
<tr>
<td>3</td>
<td>Fistula in permanent dentition</td>
<td>f</td>
</tr>
<tr>
<td>4</td>
<td>Abscess in permanent dentition</td>
<td>a</td>
</tr>
</tbody>
</table>

Do you have any problems in your mouth at the moment?  ⭕ Yes  ⬤ No  
If yes, please specify: ___________________________________________

Have you experienced abdominal pain today?  ☐ Yes  ☐ No

Number of brothers: _____  Number of sisters: _____  
Do you have TV at home?  ☐ Yes  ☐ No

Remarks: ____________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Annex 3: Health Outcome Study Indicators

1. Anthropometric Indicators

1.1 Mean Body Mass Index (BMI):

Numerator: Sum of all BMI
Denominator: Total number of students examined

1.2 Prevalence of thin (grades 1 – 3), overweight, and obese children

Numerator: Number of students within a BMI classification
Denominator: Total number of students examined

<table>
<thead>
<tr>
<th>BMI Classification</th>
<th>Age group (in years) and corresponding BMI cut-offs by gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.75 to &lt;6.25</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Grade 3 thinness</td>
<td>≤12.50</td>
</tr>
</tbody>
</table>

References:
- Establishing a standard definition for child overweight and obesity worldwide: international survey (Cole et al., 2000)
- Body mass index cut offs to define thinness in children and adolescents: international survey (Cole et al., 2007)
- K. Kromeyer-Hauschild (personal communication, June 18, 2013)
1.3 Prevalence of children with severe stunting, stunting, and very tall children based on Height-for-Age (HFA)

<table>
<thead>
<tr>
<th>HFA Classification</th>
<th>Severe Stunting</th>
<th>Stunting</th>
<th>Very tall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-score</td>
<td>&lt; -3</td>
<td>&gt; -3 but &lt; -2</td>
<td>&gt; 3</td>
</tr>
</tbody>
</table>

**Numerator:** Number of students within an HFA classification  
**Denominator:** Total number of students examined

References:
- WHO AnthroPlus Software (http://www.who.int/growthref/tools/en/)

2. Parasitological Indicators

2.1 Cumulative prevalence of STH infections: Prevalence of infection with at least one STH

<table>
<thead>
<tr>
<th>Helminth</th>
<th>Moderate to heavy intensity infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaris</td>
<td>≥ 5,000 eggs per gram</td>
</tr>
<tr>
<td>Trichuris</td>
<td>≥ 1,000 eggs per gram</td>
</tr>
<tr>
<td>Hookworm</td>
<td>≥ 2,000 eggs per gram</td>
</tr>
</tbody>
</table>

**Numerator:** Number of students who have an STH infection with any of the three soil-transmitted helminths  
**Denominator:** Total number of students examined

2.2 Prevalence of specific STH infection (Ascaris, Trichuris, or Hookworm)

**Numerator:** Number of students who have a specific STH infection (Ascaris, Trichuris, or Hookworm)  
**Denominator:** Total number of students examined

2.3 Prevalence of heavy intensity STH infections: Prevalence of moderate to heavy intensity infection with at least one of the three helminths

**Numerator:** Number of students with moderate to heavy intensity STH infection  
**Denominator:** Total number of students examined

2.4 Prevalence of heavy intensity infection of a specific helminth: Prevalence of moderate to heavy intensity infection of a specific helminth

**Numerator:** Number of students who have moderate to heavy intensity infection of a specific helminth (Ascaris, Trichuris, or Hookworm)  
**Denominator:** Total number of students examined

Reference:
- Helminth Control in School-age Children (WHO, 2011)
3. Oral Health Indicators

3.1 Caries Prevalence
   **Numerator:** Number of children with at least one tooth with caries
   **Denominator:** Total number of students examined

3.2 Caries Experience
   **Numerator:** Total number of decayed (D or d), missing (M or m), and filled (F or f) teeth (permanent or primary) of each student
   **Denominator:** Total number of students examined

3.3 Odontogenic Infection Prevalence
   **Numerator:** Number of children with at least one tooth with pulp involvement
   **Denominator:** Total number of students examined

3.4 Odontogenic Infection Experience
   **Numerator:** Total number of teeth (permanent or primary) with open pulp involvement (P or p), traumatic ulceration (U or u), fistula (F or f), and abscess (A or a) of each student
   **Denominator:** Total number of students examined

Notes
1 “DMFT” for permanent dentition and “dmft” for primary dentition
2 “PUFA” for permanent dentition and “pufa” for primary dentition

References:
• WHO Oral Health Surveys Basic Methods 4th Ed. (WHO, 1997)
• http://www.mah.se/CAPP/Methods-and-Indices/for-Caries-prevalence/
• PUFA-An index of clinical consequences of untreated dental caries (Monse et al., 2009)
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Guidance and Evaluation Section Chief, Ministry of Health

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The report was prepared by Katrina Javier and reviewed by and Jundelle Jalique, Mitch Mijares-Majini, Douglas Ball, Habib Benzian, and Bella Monse. All information presented in this report has been diligently checked and reviewed.
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September 2014

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