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ASSESSMENT FOR THE INTRODUCTION OF ZINC IN IMPROVED MANAGEMENT OF DIARRHEA IN INDONESIA



ASSESSMENT FOR THE INTRODUCTION OF ZINC IN IMPROVED MANAGEMENT OF DIARRHEA IN INDONESIA

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Table of Contents

Acronyms and Translations.....	ii
Executive Summary	iv
Introduction	1
Assessment Methodology	3
Background to Diarrhea Case Management in Indonesia: Desk Review	7
Case Management of Diarrhea	16
Health Promotion and Behavior Change	20
Pharmaceutical Management.....	25
Private Sector Assessment	30
Recommendations of National Zinc Task Force for the Introduction of Zinc Therapy and Improvement of Diarrhea Case Management.....	38
Strategy and Next Steps for USAID Support	42
Appendixes	
Scope of Work	47
Tentative Itinerary	54
People Met and Consulted	59
Zinc Task Force Meeting (February 9th, 2007), Attendance List	66
Diarrhea as a Major Problem in Pediatrics	67
Evidence on Low Osmolarity ORS and Zinc Therapy.....	72
Country Assessment Tool	79
Presentation from the Assessment Team to the Joint Stakeholders Meeting	100
Zinc Task Force Meeting (February 28, 2007), Attendance List	103
Advocacy on New Clinical Management of Diarrhea in Indonesia.....	104
Case Management and Behavior Change.....	107
Pharmaceutical Management.....	110
Indonesia Zinc Manufacturer Assessment.....	112
Market Segmentation by Company	115

Acronyms and Translations

<i>Ayam</i>	Chicken
<i>Badan POM</i>	National Agency of Drug and Food Control
BASICS	Basic Support for Institutionalizing Child Survival
<i>Bidan</i>	Midwife
<i>Bidan Delima</i>	Franchised midwife (advanced midwife)
BinFar	Directorate for Promoting Pharmaceutical Services and Medical Supplies
BKGAI	Indonesian Coordinating Board/Body for Pediatric Gastroenterology and Hepatology
BKPPASI	Coordinating Board/Body for Breastfeeding Promotion
CBR	Crude Birth Rate
CDC	Communicable Disease Control Unit of the MOH
CFR	Case Fatality Rate
<i>Daftar Obat Esensial Nasional (DOEN)</i>	Essential Medicines List
DepKes	Department of Health
<i>Desa Siaga</i>	Alert Village (prepared village – a special program of the MOH)
DG/CDC	Directorate General of the Communicable Disease Control Unit
DHS	Demographic and Health Survey
DIY	Province of Yogyakarta (Jogjakarta)
<i>FIFO</i>	First in, first out (pharmacies)
GFK	District Pharmacy Warehouse
GFP	Province Pharmacy Warehouse
HKI	Helen Keller International
HRD	Health Registration Dossier
IBI	Indonesian Midwives Association
IDAI	Indonesian Pediatric Society (<i>Ikatan Dokter Anak Indonesia</i>)
IDI	Indonesian Medical Association
IMCI	Integrated Management of Childhood Illness
IMDI	Indonesia Medical Data Index
IMR	Infant Mortality Rate
IMS	Drug Use Guide
<i>Kabupaten</i>	District
<i>Kaders</i>	Volunteer workers (community health workers)
<i>Laporan Pemakaian Dan Lembar Permintaan Obat (LPLPO)</i>	Report of Use and Request for Drugs

LGG	Larutan Gula Garam - Sugar-Salt Solution
LoORS	Low Osmolarity ORS
MIS	Management Information System
CDC	Communicable Disease Control Unit of the Ministry of Health
NAFDC	National Agency of Drug and Food Control
NSS	National Sample Survey
NTB	West Nusa Tenggara
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
<i>Pedoman informasi obat bagi pengelola obat di puskesmas</i>	Drug information for Health Center Drug Manager
<i>Pedoman Pengobatan Dasar Di Puskesmas</i>	Health Center Treatment Guide
<i>PHBS or Perilaku Hidup Bersih and Sehat</i>	Clean and Healthy Living Behavior
<i>poskesdes</i>	Village health post
Posyandus	Integrated Health Service Post (village weighing post)
PT Askes	National Health Insurance Company
<i>Puskesmas</i>	Community Health Center
<i>Pustus</i>	Sub-center
SKM	Ministerial Decision Decree (<i>Surat Keputusan dan Menteri</i>)
<i>toko obats</i>	Drugstores (in contrast to <i>apotiks</i> where a pharmacist is found)
UKKGGH	Pediatric Working Group for Gastroenterology and Hepatology/liver disorders
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USP	United States Pharmacopeia
WHO	World Health Organization
ZAT	Zinc Assessment Team

Executive Summary

1. An Assessment for the Introduction of Zinc Therapy in Diarrhea

A combined Indonesian and international team conducted an assessment of the situation of diarrhea case management and the feasibility of introducing zinc therapy in February 2007. The assessment was formed in response to a request from the Indonesian Zinc Task Force, sponsored by the United States Agency for International Development (USAID) Mission in Indonesia, and implemented by the Basic Support for Institutionalizing Child Survival (BASICS) project. The Assessment Team findings were presented to the Zinc Task Force on February 28, and a set of recommendations for action were drawn up.

2. Diarrhea Case Management in Indonesia: Problems and Opportunities

Progress in social and economic indicators in Indonesia has been dramatic over the past four decades. Infant mortality has fallen from the 140's in 1970 to 35 in 2002. Diarrhea, once the main cause of infant and childhood death claiming 25 percent of those who died, now accounts for only 7 percent of child deaths, with a mortality rate at or below 2.5/1000 children under five years of age. This fall in diarrhea mortality is the result of the consistent promotion of oral rehydration and proper dietary management by the Department of Health in close alliance with the Indonesian Pediatric Society (IDAI, Ikatan Dokter Anak Indonesia) and the Coordinating Board of Indonesia Pediatric Gastroenterology (BKGAI, Badan Koordinasi Gastroenterologi Anak Indonesia). The importance of replacing lost fluids can now be considered part of Indonesian culture.

Diarrhea morbidity, however, remains essentially unchanged, with each child suffering an average of 1.3 episodes per year. There are 25 to 30 million cases of diarrhea each year, and about 40,000 of these children die. Children generally receive additional fluids in the home for diarrhea. In about half of cases, if the diarrhea persists more than a day or two, or if the caretaker is worried about vomiting or other symptoms, she will take the child to a health worker at a government facility, to a private doctor or midwife, or buy medicine from a pharmacy or drug store. The purpose of the visit is to get treatment for the diarrhea, and most children will go home with a mix of anti-diarrheals, antibiotics, and vitamin preparations. Those who have signs of moderate or severe dehydration are encouraged to go to the hospital, where they will generally receive an infusion of IV fluids and additional antibiotics in about 60 percent of cases.

The introduction of zinc therapy has great potential for improving the case management of diarrhea. This is not only because of its direct benefits, but because it represents an effective replacement for the widely used antibiotics and anti-diarrheals that are at best expensive and ineffective in the majority of cases of acute diarrhea. The international evidence for the efficacy of zinc therapy in diarrhea includes the results of trials that were done in Indonesia. More recently, following the tsunami in Aceh, the earthquake in Central Java and Jogjakarta provinces, and the floods in Jakarta, zinc has been used to good effect and found very acceptable to community members. An observational study of children treated with zinc at a teaching hospital showed a preliminary result of 67 percent of cases completing the full 10 days of zinc tablets (45 out of 67 cases). Of those cases that did not complete the 10-day treatment, 50 percent stopped because they believed the diarrhea was resolved, and 20 percent discontinued the treatment because of the taste of the tablets. Another 20 percent did not continue giving zinc because of vomiting.

3. Production and Marketing of Zinc Products in Indonesia

The prospect for production and distribution of zinc products in Indonesia is very good. The manufacturing and marketing capacities of the Indonesian Pharmaceutical Industry are both mature. Nine of the industry leaders have been contacted and showed preliminary interest in the introduction of zinc. During an earlier visit last September by a team member, three of the four initially-contacted companies had started developing zinc formulations and have zinc products almost ready for registration. All three are among the top 10 companies with nationwide distribution coverage and intensive promotion capabilities. Any one of them can launch at scale as soon as registration is obtained from Badan POM. To ensure the earliest availability of zinc products, two components are essential: a policy decree (SKM) from the Minister of Health announcing the inclusion of zinc therapy in diarrhea case management, and a letter from the Ministry of Health to the pharmaceutical industry through the Indonesian Pharmaceutical Manufacturers Association informing them of the decree and encouraging them to submit a registration dossier to the National Agency of Drug and Food Control (Badan POM). These will ensure that all potential producers of zinc products are informed about the new policy, that zinc tablets and syrup will automatically qualify for the Essential Medicines List, and that *Badan POM* can shorten the preregistration phase of the drug registration process during which the scientific merits of zinc therapy are examined. *Badan POM* recommended registration of zinc as a therapeutic agent. Otherwise, if registered as a food supplement, it cannot claim any therapeutic benefit.

4. Government Drug Supply Management

The Government of Indonesia drug procurement and distribution system is effective. District and municipal governments do procurement of essential drugs from their own budgets. Drugs required for public health programs supported by central Ministry of Health directorates are also procured and distributed by those central programs. Buffer stocks of medicines in the “very very Essential Drug List” (vvEDL) are procured and stored at the central warehouse in case of emergencies and national disasters.

However, overstocking, expirations, and stock outs of supplies do occur because of system inefficiencies. Most inefficiency could be minimized by better coordination of data collection, quantification, and distribution at district level. Introduction of stock cards in the medical stores of all Puskesmas (health centers) would also improve drug management at that level and facilitate the process of rational drug monitoring, which will help to reinforce the use of zinc and discourage use of antibiotics and anti-diarrheals.

5. Strategy and Programs to Introduce Zinc Therapy

A lesson from the introduction of ORS in the 1970s is the importance of doctors taking ownership of zinc therapy as an important contribution to care. Making zinc freely available at community level or inexpensively over the counter before socializing it within the medical profession will diminish its perceived value as a therapeutic agent. The Task Force recommends that doctors and health staff, under a doctor’s supervision, first implement zinc therapy. Later, it can be distributed through village midwives and possibly later still by village volunteers.

Diarrhea case management activities fall under the jurisdiction of several directorates and sub-directorates of the Ministry of Health. Following the Ministerial decree on zinc therapy, appropriate changes will need to be made to all relevant policy documents and to sets of clinical standards and guidelines.

6. Professional Reorientation

The challenge to the introduction of zinc therapy is to ensure that zinc replaces the antibiotics and anti-diarrheals prescribed at present, rather than just being added to them. The largest, most influential, and most difficult group to influence will be the general practice doctors working in government health centers and in private practice. Their prescribing habits are probably the greatest influence on the practice of paraprofessionals as well as pharmacy staff. Unlike the specialists, they do not access journals regularly and have little opportunity for professional meetings. Their main sources of information about new products are the drug company representatives. Midwives are easier to reach because the Indonesian Midwives Association has an active program of monthly meetings at the sub-district level that involves all its members, as well as quarterly meetings for the district-level supervisors.

In addition to the inclusion of zinc therapy for diarrhea case management in all pre-service training curricula, it is needed in various in-service training activities. Integrated management of childhood illness (IMCI) training manuals have already been updated to include zinc therapy. The program has been running for seven years, and staff who have been trained show greater awareness of the principles of good diarrhea case management. However, only about 40 percent of health centers have staff trained in IMCI, so the program requires much more rapid expansion.

Health professionals showed considerable interest in the effects of zinc therapy, the evidence (especially Indonesian evidence) for those effects, and an explanation of the mechanisms. The Zinc Task Force recommended production of a brochure setting out this information as well as information on zinc's advantages over antibiotics and anti-diarrheals, which could be distributed to all health facilities and health staff. Distribution to midwives would be most effective if channeled through association meetings and module development for in-service training. In districts with IMCI training teams, they should be encouraged to reach all other staff. In the end, the lesson learned from ORT's success was that a consistent message to both providers and the public eventually became accepted as normal practice. In the current situation, the Ministry of Health and the pharmaceutical industry can work together on the appropriate set of messages. (See the next section.)

7. Public Awareness and Education

The main goal of a public awareness campaign is to promote the three main components of diarrhea case management: oral rehydration therapy (ORT), zinc therapy, and continued feeding of the child. This common message needs to be coordinated between the Ministry of Health and the pharmaceutical industry. The Task Force recommended a professionally designed communication campaign by the Ministry of Health to carry the basic message of the three components.

Print materials such as posters should be clearly displayed in patient consultation rooms of all health facilities and at village health post (*Posyandus*) meeting sites. Posters and media campaigns will assist public awareness, but they will be inadequate for education of caretakers. The task force recommends the revitalization of the Oralit corners to teach mothers how to dissolve zinc tablets, review the importance of ORT and continued feeding, and make sure that the first dose of zinc is taken.

To secure the cooperation and support of industry for the message of the three key components of diarrhea care, the Task Force recommended that the MoH / *Badan POM* Drug Information Center and the Indonesian Pediatric Association (IDAI) and the

Coordinating Board of Indonesia Pediatric Gastroenterology (BKGAI) provide guidance and scientific evidence for the design of industry's promotional and packaging materials. This will be important both for education of health professionals reached by drug sales representatives as well as for the public.

1. Introduction

Background

Zinc deficiency has been found to be widespread among children in developing countries. Clinical and field studies have consistently shown an association between zinc deficiency and higher rates of infectious diseases, including skin infections, diarrhea, pneumonia and malaria. During the past eight years, results from clinical and community trials have demonstrated that the provision of zinc during episodes of acute, watery diarrhea in children under 5 years old shortens the duration of the disease, reduces its severity, and has a preventive effect on future episodes. In May 2004, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) issued a joint statement recommending a 10–14 day course of zinc for treatment of diarrhea, in conjunction with oral rehydration solution or oral rehydration therapy (ORS/ORT). The recommended dosage is 20 mg/day for children 6 months to 5 years of age, and 10 mg/day for children 2-6 months of age. Studies in infants younger than 2 months old are currently underway.

Indonesian Context

There has been active interest in the value of zinc in the management of childhood diarrhea in Indonesia for the past decade. One of the earliest clinical trials of zinc therapy for diarrhea was done in Indonesia, and further clinical and community studies were done by the Pediatric Departments of the Medical Faculties of Gadjadara University in Yogyakarta and Airlangga University in Surabaya. Zinc therapy has also been used in disaster situations following the tsunami in Aceh, the earthquake in Jogjakarta and Central Java, and the floods in Jakarta.

The Global Zinc Task Force organized an Indonesia Zinc Introduction Workshop in Jakarta from September 26–27, 2006. In follow-up discussions with Dr. Nyoman Kandun, the Director General for Disease Control, Ministry of Health (MOH), it was agreed that a National Zinc Task Force should be formed under MOH leadership to introduce zinc into the management of diarrhea in Indonesia.

The MOH was eager to proceed and has led the process. Dr. Nyoman Kandun has demonstrated his support for zinc in the treatment of diarrhea and has designated Dr. Wayan Widaya, Sub-Directorate of Diare, MOH/CDC, as the key contact person in the MOH and Task Force. The Zinc Task Force includes representatives of the key stakeholders both inside and outside the MOH; it met first on December 4, 2006. It has formed a *Steering Committee* made up of key MOH departments and pediatric gastroenterology associations, an *Implementing Team* of MOH departments, professional associations, and the private sector, and a *Technical Advisory Team* of representatives of WHO, USAID, UNICEF, and Helen Keller International (HKI).

Having accomplished the preliminary advocacy phase, it was agreed that there should be a situation assessment to assist the MOH and its partners in moving forward with the introduction process for zinc therapy. Through conversations between the USAID Mission in Indonesia and Global Health, USAID requested technical assistance from the BASICS

Project for the introduction of zinc in conjunction with ORS/ORT and dietary guidelines for treatment of diarrhea in Indonesia.

The assessment objectives were as follows:

The overarching objective was to decrease morbidity and mortality from diarrhea in children under five by strengthening child health and diarrheal disease programs in Indonesia.

1. Strengthen the capacity of the Indonesian MOH and its key implementing partners to reinvigorate diarrhea disease programming, with emphasis on strengthening case management, as well as introducing zinc in the treatment of diarrhea.
2. Assist the MOH and its key implementing partners to develop strategies, plans, and a timeline for introducing improvements to revitalize ORT with the new ORS formula and introduce zinc in the treatment of childhood diarrhea.
3. Assist the MOH to address particular implementation challenges associated with decentralization that are facing the Diarrheal Disease Program and Child Health Programs.
4. Collect data on all aspects of pharmaceutical management including: policy and legal framework, selection, procurement, distribution, rational use, and pharmacy MIS to inform the development of strategies that will ensure secure availability and rational use of zinc and low-osmolarity ORS for the clinical management of diarrhea.
5. Analyze and identify supply and demand opportunities in the Indonesian private sector for the sustainable and at scale introduction of zinc in the treatment of diarrhea in support of DepKes (MOH) efforts.

2. Assessment Methodology

Overview

The assessment was divided into four phases (detailed below):

1. Preparatory phase prior to the country visit (1 to 2 months, December 2006 to January 2007)
2. In-country data collection and assessment implementation (3 weeks, February 2007)
3. Post-assessment Stakeholder presentations and planning (end February 2007)
4. Post-assessment support (March 2007 onwards).

(Appendix 1 contains the Assessment Team's scope of work.)

Assessment Team

External members

Case management	Jon Rohde	BASICS
Behavior change	Joan Schubert	BASICS
Logistics/drug management	Jude Nwokike	RPM Plus
Public-private partnership	Camille Saadé	AED/POUZN
Community & health systems	Iain Aitken (team leader)	BASICS

Internal members

Dr. Wayan Widaya	CDC/Diarrhea, MOH
Dr. Yati Soenarto	IDAI, Diarrhea Task Force
Dr. Yulitta Evarini	CDC/Diarrhea, MOH
Mr. Gandi	CDC/Diarrhea, MOH
Mr. Ir Sunarko	Nutrition Directorate, MOH
Ibu. Ria Sukarno	Basic Health Services, MOH
Ibu. Sri Boerdiharjo	USAID, Health and Nutrition, Indonesia

Methodology and Timeline

Tasks Prior to Country Visit

Literature review

During the desk review, the team assembled and collated information from published and unpublished literature and surveys on diarrhea and its management in Indonesia. The purpose was to inform the assessment team and guide it in the planning and implementation of the in-country data collection and assessment.

- a. The BASICS Office performed an Internet literature search to collect articles both on zinc therapy and diarrhea, and on diarrhea in Indonesia.
- b. A research team from the Subdivision of Gastrohepatology, Child Health Department of the Faculty of Medicine at Gadjadara University in Yogyakarta conducted an in-depth study of the Indonesian literature on diarrhea and its management. Dr. Juffri led the team, with guidance from Professor Yati Soenarto and Dr. Jon Rohde.

In-country Assessment Activities

The timetable for in-country activities is in appendix 2.

The list of names of people met and consulted with is in appendix 3.

Week 1: Jakarta

Stakeholder meetings were designed to introduce the assessment team members to the key stakeholders to inform them of the planned activities and their purpose, to gain their insights and advice on the current situation of diarrhea management and the opportunities and problems associated with the proposed re-emphasis on improved case management and the introduction of zinc and low-osmolarity ORS. On the first morning, the team met with Dr. Nyoman Kandun, DG/CDC, Dr. Rosmini, Director of Infectious Diseases, and Dr. Wayan Widaya, Head of the Sub-Directorate of Diarrhea.

Stakeholder and key informant interviews were held the first week with key stakeholders and informants to collect detailed information relevant to their individual scopes of work. Early meetings included members of the USAID Mission, the staff of the USAID-funded Health Services Program (HSP), WHO, UNICEF, and HKI. Further meetings were held with different MOH staff and representatives of the pharmaceutical industry.

Task Force and Assessment Team meetings

The team met with the Zinc Task Force on the morning of Friday, February 9, to introduce the assessment team and their program, and to gain initial guidance on priority issues to be covered in the assessment. (See the attendance list in appendix 4.) Dr. Yati Soenarto summarized the desk review findings (appendix 5), and Dr. Jon Rohde presented the latest evidence on low osmolarity ORS and zinc therapy (appendix 6).

Private Sector Assessment

Based on experiences from other countries in the assessment of the private sector for the sustainable supply and demand of different health products and services, the team adapted a tool used for zinc country assessment in Madagascar to the Indonesian situation. Mr. Saadé enlisted the technical advice of Mr. Parulian Simanjuntak, a senior pharmaceutical industry executive, to help organize appointments with the industry and provide guidance.

Week 2: Fieldwork

During this time, the team divided into three sub-teams to visit separate regions of the country. They used the Assessment Tool (see appendix 7) prepared beforehand and modified during the first week to collect information through:

- Key Informant and health provider interviews
- Discussion groups with staff of health offices and facilities and community members
- Review of available data
- Direct observations
- Facility surveys and inventories

The purpose of the interviews and discussions was not to collect large amounts of primary data, but rather to reach a better understanding of the data that is available and of the resources, approaches, barriers, and opportunities for a program to improve diarrhea case management and introduce zinc therapy.

Sampling frame for the fieldwork:

The selection criteria for the provinces and districts to be visited:

- Districts supported by USAID or major partners
- Contrasts in epidemiology of diarrhea and the quality of health programs
- Logistically uncomplicated for a short program of visits

Within districts, attention was given to:

- Service delivery and its quality: public–private, urban–rural, hospital through village levels, including commercial pharmacies and drug stores
- The influences and activities that determine therapeutic behaviors and quality of care
- Logistics: pharmaceutical procurement, supply and distribution, management, and drug and non-drug outlets
- Behavior change: roles of nongovernmental organizations (NGOs), community participation, volunteers, role of information, education, and communication/behavior change communication media
- The organization and management of child health services, including information systems
- Experience of the use of zinc therapy in programs

The three teams went to the following provinces:

1. West Java – Tangerang District (Entire group)
2. Medan and Aceh
3. DIY and Central Java
4. Surabaya, Bali, and NTB - Lombok.

These visits included five provincial health offices, six provincial hospitals, eight *Kabupaten* (district) health offices and eight *Kabupaten* hospitals, three private hospitals, and five private clinics. In both urban and rural settings, the team visited 19 *Puskesmas* (health centers), three *Pustus* (sub-centers) and seven *Posyandus* (integrated village clinics). They visited 19 *Bidan* (midwife) posts, *Polindes* (government), and private (*Bidan Praktek Swasta* and *Bidan Delima*), six provincial and *Kabupaten* drug warehouses, and 27 hospital and private pharmacies or drug stores. The team interviewed pediatricians, general doctors, nurses, *Bidans*, various field workers, and numerous *kaders* in villages and *Posyandus*. The teams were warmly welcomed and encouraged to both inquire and observe as they wished. The team was provided with access to all the data requested—quite an amazing amount—and made both scheduled and unplanned visits.

Appendix 2 shows the timetables and itineraries, and appendix 3 lists the places visited and people met.

Week 3: In-country Briefing and Action Planning

Team meetings:

- The team collated, analyzed, and placed the fieldwork data into a presentable format for presentations and the report
- Consensus was reached on the key observations and their implications for recommended actions and activities for the implementation of zinc therapy and improved diarrhea case management

Separate meetings with key stakeholders for:

- Validation of findings
- Discussion of their significance
- Formulation of possible intervention strategies and activities.

Joint Stakeholder Meeting(s) (USAID, MOH, or key partners WHO, UNICEF, and so on)

Presentation to Dr. Nyoman Kandun, DG, MOH/Disease Control (see appendix 8)

- Presentation of key assessment findings
 - Discuss and seek consensus on priority issues
 - Planning Sessions: develop detailed recommendations for revitalizing ORT and introducing zinc

Zinc Task Force Meeting (February 28, 2007)

- Attendance (see appendix 9)
- Summary of progress. (Dr. Wayan Widaya) (see appendix 10)
- Group work
 - Presentation of assessment team findings (appendixes 11 and 12)
 - Develop recommendations for next steps

Post-visit support

- Produce final report, including comprehensive assessment instrument/materials and recommendations
- Develop more detailed implementation plan based upon initial strategies, plan, and timelines drafted in stakeholder sessions post assessment

3. Background to Diarrhea Case Management in Indonesia: Desk Review

3.1 Introduction

Indonesia is a vast country, extending across more than 3,000 miles of the equator. Its population of 220 million inhabits some 17,000 of the 35,000 islands of the archipelago, but most are found in Java, Sumatra, and nearby islands. While still predominantly rural (52%) several mega cities (Jakarta, Surabaya, Bandung) and many provincial large cities are modern with both wealthy and urban poor populations.¹ Thus, generalities about the health and social conditions of Indonesia are extremely hard to make.

Progress in both social and economic indicators has been dramatic over the past four decades, punctuated by severe setbacks from natural disasters (tsunami, earthquakes, and volcanic eruption), political upheavals, and the economic crisis in the late 1990s. Infant mortality, for instance, has fallen from 140s in 1970 to 35 in 2002.² Health indices vary widely, with DIY (Jogja) having IMR of about 12/1,000 births and fertility below replacement with CBR of 12.8/1,000, underweight about 14 percent, and severe malnutrition of 1.2 percent, to levels three times these and more in outer islands.

3.2 Diarrhea morbidity and mortality

Diarrhea, once the major cause of infant and child death claiming some 25 percent of those who died, has diminished through a persistent and well planned effort of health authorities, to account today for some 7 percent of child deaths (table 1), with death rates from diarrhea of 2.5/1000 or less in under fives (table 2). This fall in diarrhea case mortality has been driven by the Department of Health in close alliance with the Pediatric Society (IDAI) with publications and national meetings that number in the hundreds over the past three decades, promoting oral rehydration and proper dietary management of diarrhea. Education on replacement of lost fluids has reached into every village through the *Posyandu* system. Diarrhea deaths are now considered a cause for embarrassment and investigation.

Table 1: Diarrhea proportional mortality estimated rates
(from National Household Surveys)

Cause of death in infants	1980 (%)	1985 (%)	1992 (%)	1995 (%)
Diarrhea	23.0	15.7	7.7	13.9
Respiratory	22.6	14.1	25.2	30.0
Infection (other)	3.9	4.6	5.6	3.5
Infectious diseases (EPI)	1.2	8.7	1.7	2.1
Malnutrition	0.4	1.8	0.7	
Perinatal disturbances	11.7	18.2	30.8	30.4
Tetanus	9.8	19.6	6.6	3.7
Cause of death in under-fives				
Diarrhea	26.9	26.4	23.0	19.2

¹ For population information see UNICEF's "At A Glance: Indonesia," www.unicef.org/infobycountry/indonesia_statistics.html#27.

² For mortality and fertility levels see Badan Pusat Statistik (BPS) – Statistics Indonesia (BPS) and ORC Macro, 2003, "Indonesia Demographic and Health Survey 2002-2003," BPS and ORC Macro, Calverton, Maryland.

Table 2: Diarrhea death rates per 1,000/year over time

Age group	1980	1985	1992	1995
<5 yrs	7.7	5.7	4.0	2.5
1-4years	6.6	3.7	2.1	1.0
Infants	22.0	13.3	7.3	8.0

Morbidity, however, remains essentially unchanged, with each child suffering an average of one diarrhea episode per year (some 25-30 million cases/year), though this varies tremendously by geography, economic group, and nutritional status. Repeated studies over the past four decades have shown little or no change in morbidity (attack rate), with peak age in the second half of infancy and second year of life where two or more episodes/year are expected (table 3).

Table 3: Annual incidence of diarrhea in children under five years of age by province, 1983–2000

Provinces	1983 (%)	1989 (%)	1990 (%)	1991 (%)	1996 (%)	2000 (%)
Sumatera Utara	2.08	0.66			0.7	1.6
Sumatera Barat	1.29	1.03				
Riau					0.6	
Sumatera Selatan	2.09	0.73			1.5	
Bengkulu				0.89		
Lampung	1.42	0.73				2.7
Kalimantan Barat	1.99		1.16		1.3	1.7
Kalimantan Timur						0.9
Kalimantan Selatan	0.81		0.34		1.4	
Kalimantan Tengah				2.2		
Jawa Barat	3.9	1.17			1.4	
Jawa Tengah	1.07	0.73	1.15			
D I Yogyakarta	1.84					0.5
Jawa Timur	9.08	1.51	1.27			1.3
Bali	1.5		0.63		0.7	0.6
Sulawesi Utara	1.45			1.02		1.2
Sulawesi Tengah						
Sulawesi Selatan	3.08	0.39		0.67	1	0.8
Sulawesi Tenggara						
Nusa Tenggara Timur	5.7	0.24				
Nusa Tenggara Barat				0.83	2.5	2.7
Maluku				0.65		
Papua						
Rata-rata	1.98	0.78	1.08	0.88	1.1	1.2

A 10-province survey of 18,000 households in 2000 found annual incidence ranged from 0.5 episodes to 2.7 episodes per under-five child per year (table 3). With some 30 percent of children malnourished (<2SD WAZ), the additional risk (2–3 times the attack rate of normally nourished) deaths are further concentrated in this group. The contribution of diarrhea to this relatively high malnutrition rate is certainly significant, though unquantified.

The reason for the decline in diarrhea deaths has been the reduction in the case fatality rate, especially from dehydration. In 1974, Brotowasisto, then head of the cholera and diarrhea bureau, estimated 40 million cases of diarrhea with an attack rate of about 1.6 cases/year/child resulting in 350,000–500,000 deaths (an overall CFR of 1.2 percent).³ Today, DepKes household surveys estimate an attack rate of 1.3 episodes per child per year with a case fatality rate of only 1.5/1,000 cases (a decline of about 90% in CFR) or about 40–45,000 deaths/year due to diarrhea. Nearly five million infants are born each year, of whom 175,000 die before age one, 20-25,000 from diarrhea-related illness. Another 15,000 or so die from diarrhea before reaching five years of age. The overall case fatality is therefore extremely low—about 1.6 deaths per 1,000 episodes, but with over 25 million episodes/year, the toll remains unacceptably high. The changing pattern of deaths is instructive; while in 1980, dehydration still accounted for 33 percent of diarrhea deaths, this fell to 7 percent by 1992, and remains at that level today, while persistent diarrhea and malnutrition account for about 70 percent of diarrhea deaths, underscoring the dual role these conditions (table 4).

Table 4: Proportion of mortality causes of diarrhea in children <5 years (%)

Year	IMR	Dehydration	Persistent	Dysentery	Accompanying Illness
1980	100	33	43	15	9
1992	55	7	60	13	20
2000	45	7	58	20	15

The concerted efforts of the Department of Health (DepKes), allied with the private sector (doctors' associations, especially the pediatricians, the large pharmaceutical industry, nursing and midwife associations, and others) and universities have resulted in a fall in reported hospital case fatality from 13 percent to under 2 percent between 1970 and today, with a far lower figure in those treated as outpatients or private practice. This can readily be attributed to the nationwide effort initiated in the early 1970s to universalize treatment with oral rehydration using both home solutions (sugar salt solution—LGG) and the widespread availability and near universal promotion of packaged ORS (WHO formula).

3.3 Diarrhea case management

Numerous studies, most in Bahasa Indonesia, have documented the changing attitudes to parents towards diarrhea. Previously, (and to some extent still today) diarrhea was felt to be an unavoidable concomitant to growth—“*tambah pintar*” or the child getting cleverer. It was greeted with traditional herbal medications, soft foods, or no foods at all, and general neglect. Gradually, with the extension of formal education and the widespread promotion of fluids for diarrhea, mothers today largely recognize diarrhea as an illness, though generally mild, that requires action at home with increased fluids and continued feeding, especially breast milk. They see ORS as the next step to be taken if recovery does not occur in hours to a day or so.

Used widely by private doctors, almost universally in government health centers and hospital outpatient departments, and to a lesser but significant extent by drug sellers, the lay public can buy over-the-counter ORS in numerous small local shops, even in the remotest village. Household surveys throughout the 1990s and early this century confirm ORS use in about 50 percent of cases with some 20–30 percent more using recommended home fluids

³ Brotowasisto, “First National Seminar on Rehydration,” 1974. Indonesia Ministry of Health.

(table 5). DepKes reports over the past decade, while substantially underreporting the total number of cases treated (missing reports at each level), that ORS packets were given to between 89–100 percent of cases with an average of 2.8–4.1 packets given per case. Indonesia has one of the highest uses of increased fluids in response to diarrhea in the world.

Table 5: Percent of under-5 children with diarrhea given ORS and/or ORT

Study Place and Year	ORS %	ORT %
Six Hospital study 2006	57	
DHS 1993	46.3	
DHS 1997	48.8	
DHS 2002/2003	35.9	48
Routine DepKes Statistics 1997–2006	Given to 89–113% of patients—average 2.8–4.1 packets each	

Source: DHS 2003.

At the same time, surveys show that Indonesians have an extremely high use of antibiotics in cases of diarrhea. A 1998 study of patients visiting government health centers in five main provinces documented an average of 85 percent of childhood diarrhea cases had received antibiotics.⁴ In 2006, a multi-center study of nearly 2,000 children presenting with diarrhea at six teaching hospitals found that 33 percent had already received antibiotics, 15 percent anti-diarrheals, and some 35 percent other drugs, while 56 percent had received ORS.⁵ These hospitals provided only ORS as therapy, but they must withstand the invariable request for “medicine to stop the diarrhea.” Non-teaching hospitals do not even try to resist, using IV infusions and lactobacillus, and often giving various antibiotics as well.

3.4 Treatment-seeking behavior

Treatment-seeking behavior for diarrhea varies widely depending on location. The extensive network of some 240,000 *Posyandus* (village health posts) staffed by trained volunteers supplied with ORS packets to dispense for free made proper therapy available in the neighborhood (urban) and village until the 1990s. All 7,000 government health centers have long provided ORS packets, and most are reported to have demonstration ORT corners where demonstrations of LGG (homemade sugar–salt solution) as well as ORS use are made regularly. Nonetheless, use of these facilities is limited, based on patient perceptions of severity and convenience.

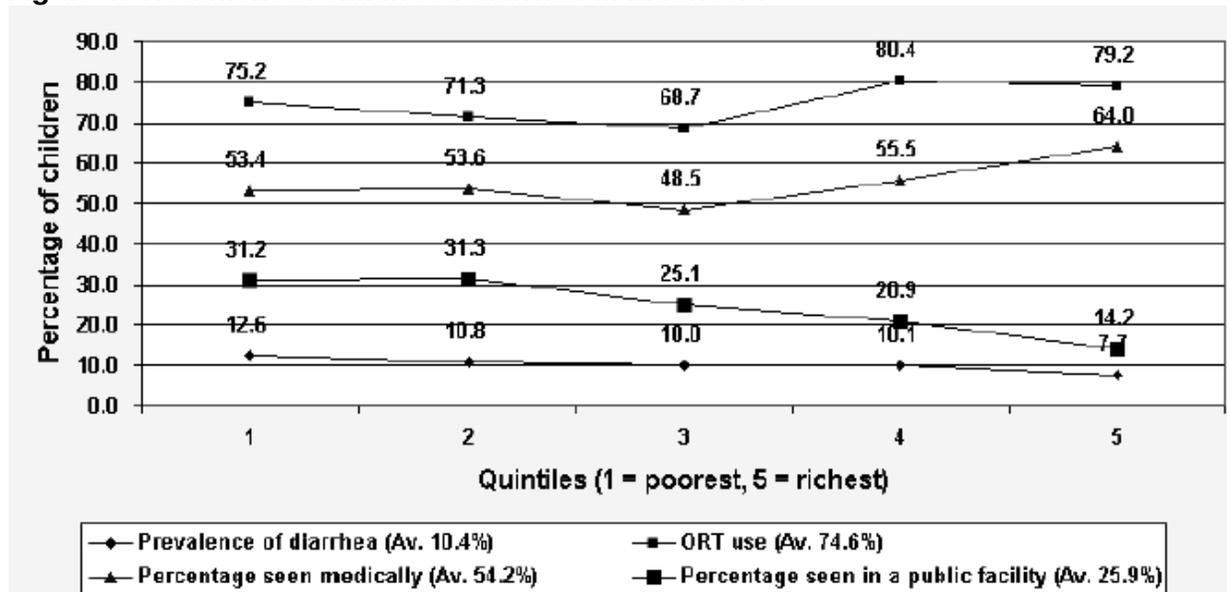
The DepKes information system reported about five million cases per year, virtually all treated with ORS, throughout the 1990s (with lower reports in recent years due to failure of the reporting system). This suggests that about 20 percent of the total estimated cases of diarrhea are seeking care at government health centers and correlates reasonably with field studies of health care seeking behavior. In 2004, 23 percent of Jakarta slum children with diarrhea were taken to a public health center, 16 percent to a hospital, 18 percent to a

⁴ Iwan Dwiprahasto, “Rational Drug Use for Diarrhea,” BKGAI–National Congress II, Bandung, July 2003: 78–90.

⁵ Yati Soenarto, “Six Hospital Surveillance Study – 2006.” Unpublished.

private doctor; 9 percent bought drugs and the rest used home or traditional treatment.⁶ Large representative national DHS surveys in 1994, 1997, and 2003 found consistently that about 50–55 percent of children with diarrhea are taken to a health provider (government center, hospital, or private). A large 2006 USAID-assisted field survey found 46 percent sought care in a facility for child diarrhea.⁷

Figure 1: Treatment of childhood diarrhea in Indonesia



Economic status affects health care use more than the frequency of diarrhea. In figure 1, the average prevalence of diarrhea is 10.4 percent of children. Children in the richest quintile are 1.2 times more likely than children in the poorest to be treated by a medical provider. However, children in the poorest quintile are 2.2 times more likely than children in the richest quintile to be treated in a public facility.

While numerous anecdotal reports in Jakarta suggest that the extensive *Posyandu* system, with 240,000 posts at its active peak in the 1990s, is widely moribund today, others attest that attendance at *Posyandu* activities reaches over 80 percent in Java and above 60 percent in many of the outer islands. The NSS surveillance confirms these figures up through 2003 and the 2006 USAID provincial survey found 68 percent had attended a post in the last month, with no area under 60 percent⁸. HKI confirms that the *Posyandus* are the major factor in the acclaimed success of nationwide high-dose vitamin A distribution, which now reaches over 80 percent of under fives twice a year.⁹ Supported by *Bidan desa* (village midwives) who number 50,000 to 60,000, the village outreach system is a huge health asset to the country, supporting the activities of the 7,000 plus government health centers (*Puskesmas*) to which patients are referred. *Kaders*, volunteer community health workers associated with the *Posyandus*, have been repeatedly trained in the management of diarrhea and supplied with ORS packets (practically the only “medicine” they are allowed to

⁶ Cyrus H. Simanjuntak, et al., “Diarrhea Episodes and Treatment-seeking Behavior in a Slum Area of North Jakarta, Indonesia,” *Journal of Health, Population, and Nutrition*, 2004, June 22(2): 119–29.

⁷ “BASICS Human Services Baseline Household Survey: Indonesia Health Services Program (HSP) in 6 Provinces, 30 Districts.” USAID. 2005.

⁸ “NSS Report 1999–2003,” (ref 9) and “HSP Report Field Study Areas 2006” (ref 11).

⁹ Helen Keller International, “Nutrition and Health Trends in Indonesia, 1999–2003,” *Annual Report 2003*. HKI. 2004.

dispense), and, they have promoted sugar salt solution (LGG) and other home fluids for three decades.

3.5 Breastfeeding and breast milk substitutes

While continued feeding and encouragement of breastfeeding are widely promoted in training courses and promotional materials, and old cultural norms of “resting the gut” are largely beliefs of the past, there is a very strong public bias towards seeking medication in preference to dietary therapy. Fully 80 percent of infants receive breast milk up to and past their first birthday, but only 25–30 percent initiate breastfeeding within two hours of birth and a mere 12 percent were found to exclusively breastfeed up to six months in a recent six province household survey.¹⁰ The feeding bottle remains a dangerous instrument in Indonesia, especially amongst the poor. Infant formula company promotions are seen not only in public, in general food stores, in *Toko Obats*, and in many *Puskesmas*, but are also widely advertised in the pediatric literature. The products promoted specifically for low birth weight babies and to avoid milk allergies in babies 0–6 or 12 months are especially pernicious and most probably in violation of the International Code of Marketing of Breast-Milk Substitutes.

3.6 Research in diarrheal disease control

WHO and other international bodies have long recognized Indonesian efforts in diarrheal disease control. Academic departments of pediatrics have been active in pre-service teaching, demonstration, and setting high standards. They have conducted and published literally hundreds of studies on etiology, treatment, feeding, cultural perceptions and expectations, and the importance of childhood diarrhea largely in the Bahasa Indonesia I literature.¹¹ The Indonesian Pediatric Society (IDAI) has created fora in support of correct diarrheal disease case management through its Gastrohepatology Coordinating Working Group (UKKGGH), Coordinating Board of Indonesian Pediatric Gastrohepatology (BKGAI), and its Coordinating Board of Promotion of Breast Feeding (BKPPASI) that have extended their research, training/education, and promotional activities to general doctors (IDI), midwives (IBI), nutritionists, and others. The continued support for local research, its publication in Indonesian journals, and the numerous annual meetings on the subject of rehydration and diarrheal disease have contributed immeasurably to the “rehydration culture” that is responsible in a major way for the decline in diarrheal mortality to nearly negligible levels. This highly significant decline, in turn, can take major credit for the dramatic fall in infant and young child mortality in the country over the past three decades.

Pediatric interest has sparked research as part of a global effort to improve oral rehydration and, more recently, in the use of zinc to reduce mortality, persistent diarrhea, recurrent incidence, and future morbidity from both diarrhea and acute respiratory infection. Thus the value of low osmolarity ORS (LoORS) has been repeatedly demonstrated in studies and has been recommended since 2005 by DepKes to replace the standard WHO higher osmolarity ORS used so successfully over the past three decades. Unfortunately, this formulation is not yet widely available on the market or to DepKes from local suppliers. The “old” formula remains available in the community, although its use is limited to health facilities.

¹⁰ “HSP Report of 2006 Baseline Household Survey in Six Provinces.”

¹¹ See, for instance, *Paediatrica Indonesiana*, and the proceedings of the BKGAI meetings every 2–3 years; the most recent meeting in Bandung 2003 contained over 60 papers on diarrhea.

3.7 Indonesian experiences with zinc for diarrhea

Indonesia has participated in the international investigation of zinc use as an adjunct to diarrhea therapy. The meta-analysis conducted by Black¹² and colleagues contains one study from Indonesia¹³ demonstrating lesser diarrhea duration in zinc recipients, as part of the global experience leading to the WHO recommendation to include zinc in routine standard diarrhea treatment guidelines.¹⁴

Unpublished clinical trials in Indonesia support the global recommendation. Among 70 randomized patients in Surabaya, those receiving zinc had a mean duration of diarrhea of 1.4 days versus 2.5 in the control group.¹⁵ In Yogya, zinc was given to 100 patients with refusal by only two. Follow up of 76 patients showed that over 67 percent had consumed the full 10-day course, while the remainder had stopped after the diarrhea ceased. Only two cases of diarrhea were reported in the subsequent three months of follow-up.¹⁶

Zinc has been investigated in supplement trials in several Indonesian studies lasting up to six months with no adverse effects. Indeed, the only adverse effect of concern has been an apparent competitive effect on iron absorption when both zinc and iron are given at the same time, thereby diminishing slightly the attendant rise in hemoglobin.¹⁷

Zinc, in doses and duration given for diarrhea, does not cause anemia, nor does it appear to interfere with copper absorption. The therapeutic ratio of zinc is very low—i.e., the recommended dose compared to the toxic dose is a ratio of 1/10–15.¹⁸ Zinc has been found to be well tolerated by children in most formulations, though a metallic taste can lead to refusal. The dispersible tablet has long durability in blister pack in humid climate and is readily transported. Syrups are also used to provide zinc and are easily administered to children, their only disadvantage being bulk in shipping.

3.8 Cost-benefit analysis

The potential reduction in lives lost in Indonesia, reduced morbidity, and even improved nutritional status make the introduction of zinc into the standard treatment of diarrhea, as recommended by WHO, a most attractive prospect for Indonesia. In addition to the reduction in morbidity and mortality, there are also potential financial savings. Table 6 presents two situations and the results of each. The first is where half of children with diarrhea who are currently brought for treatment receive zinc therapy. The second is where all children with diarrhea receive zinc. This would mean extensive distribution through village kaders and drug stores as well as health facilities. The 35 percent reduction in mortality is calculated equally for those seeking medical care and those who stay at home, however, the effect is likely to be much greater among those who seek care because seeking care is dependent more on the sickness of the child than access to care. The cost of each life saved is

¹² Z. A. Bhutta, S. M. Bird, R. E. Black, K. H. Brown, J. M. Gardner, Aet Hidayat, et al., "Therapeutic Effects of Oral Zinc in Acute and Persistent Diarrhea in Children in Developing Countries: Pooled Analysis of Randomized Controlled Trials," *American Journal of Clinical Nutrition* 2000, 72: 1516–122.

¹³ A. Hidayat, A. Achadi, Sunoto, S. P. Soedarno, "The Effect of Zinc Supplementation in Children under Three Years of Age with Acute Diarrhea in Indonesia," *Medical Journal of Indonesia* 1998, 7: 237–41. Only Sunoto (no first name)

¹⁴ WHO, *The Treatment of Diarrhea – A Manual for Physicians and Other Senior Health Workers*, WHO/CAH/03.7, Geneva: WHO. 2005.

¹⁵ M. S. Subijanto. Personal communication. 2007.

¹⁶ Yati Soenarto. Personal communication. 2007.

¹⁷ Lind et al., "A Community-Based Randomized Controlled Trial of Iron and Zinc Supplementation in Indonesian Infants: Interactions Between Iron and Zinc," *American Journal of Clinical Nutrition* 2003; 77: 883–90.

¹⁸ Gary J. Fosmire, "Zinc Toxicity," *American Journal of Clinical Nutrition* 1990, 51: 225–27.

estimated at \$446, consistent with the more sophisticated cost effectiveness analysis published in the *WHO Bulletin*.¹⁹

Potential savings from the reduced use of antibiotics will only apply to those who seek medical treatment, so that extending zinc therapy to all those who stay home will have no further impact on antibiotic use. If we assume that use of zinc treatment may reduce antibiotic use by half, then at a unit cost of \$.25 per patient, giving zinc therapy to the 50 percent who seek treatment, would save twice the amount spent on zinc in antibiotic costs. (Those savings would be lost if zinc were given to all cases of diarrhea.)

Savings in morbidity and hospitalization, based on coverage of 50–100 percent, amount to \$1.15 million and \$2.30 million, respectively. Together with savings from reduced antibiotic use, these represent the overall economic benefit for every dollar spent on zinc therapy. If zinc therapy is given to the 50 percent of children brought for medical attention, the benefit-cost ratio is about 2.4. If zinc therapy is given to all children with diarrhea (those cared for at home as well as those brought for treatment), the benefit-cost ratio is reduced to about 1.4. Basic costs and benefits can be modified according to assumptions of reduction in deaths, new cases, zinc costs, and medicine costs saved, but the overall benefit economically remains obviously positive.

¹⁹ B. Robberstad, et al., "Cost-Effectiveness of Zinc as Adjunct Therapy for Acute Childhood Diarrhea in Developing Countries," *WHO Bulletin*, July 2004, 82: 523–31.

Table 6: Costs, benefits, and savings from zinc therapy in cases of acute diarrhea

	A	B	C	D	E	F	G
	Cases of diarrhea In children / year Zinc: 15% case reduction	Deaths / year Zinc: 35% death reduction	Cost of zinc treatment (\$) \$0.25 per case	Savings if antibiotic use in zinc-treated cases is halved (4) \$1.0 per case	Savings from reduced number of cases (5) 50% cases are treated at \$1.0	Savings from reduced hospitalizations (6) (\$35 per episode) 20% reduction in zinc-treated cases	Total savings from zinc treatment D+E+F
Treat 0% cases with zinc (1)	25,000,000	40,000	\$0.0	\$0.00			
Treat 50% cases with zinc (2)	23,125,000	33,000 (7)	\$3,125,000	\$6,250,000	\$937,500	\$210,000	\$7,397,500
Treat 100% cases with zinc (3)	21,250,000	26,000 (7)	\$6,250,000	\$6,250,000	\$1,875,000	\$420,000	\$8,545,000

- (1) Current situation, before zinc is introduced.
- (2) Assume that this 50% is the same 50% that seek treatment at present.
- (3) Treating 100% cases of diarrhea would mean zinc distribution through village kaders and drugstores.
- (4) Antibiotics received only by the 50% that seek treatment.
- (5) Assumes that only 50% of future cases prevented by zinc would seek treatment.
- (6) Assumes a hospitalization rate of about 1 in 400 cases.
- (7) A cost of \$446 per life saved.

4. Case Management of Diarrhea

The assessment team separated into three groups traveling to North Sumatra (Aceh, Sumut), Central Java (DIY and Jateng), and eastern areas (Jatim, Bali, NTB - Lombok). In the course of a week in the field the team visited a large variety of health facilities and spoke with pediatricians, general doctors, nurses, *Bidans*, various field workers, and numerous *kaders* in villages and *Posyandus*. Some of those interviewed worked exclusively in private practice, but many worked both in a government job during the day and in a private practice in the evenings. The resulting impressions are legion, but with respect to diarrhea case management, they are summarized below.

4.1 Health services in Indonesia

Primary care in Indonesia is provided in and through a network of health centers (*Puskesmas*) and a smaller number of sub-centers (*Pustus*). Most *Puskesmas* provide outpatient care, maternal and child health services including EPI, and environmental health services. A small proportion of them may have in-patient beds and provide 24-hour services in more densely populated areas. They are staffed by one or more doctors, nurses, and midwives, and a dispenser and auxiliary staff. The *Pustus* serve smaller populations and usually have a nurse and a midwife to provide outpatient care and MCH services. *Puskesmas* and *Pustus* are generally open in the mornings, while in the afternoons and evenings, the doctors and many of the midwives work in their private clinics. Midwives need to be licensed to practice privately, and increasing numbers of them are becoming *Bidan Delimas*, members of a private midwifery franchise that guarantees a certain quality and supports the midwives in various ways.

The closest health care support to families is the *Posyandu* and the volunteer *kaders* that support it. *Posyandus* (integrated service post) started in the 1970s as an activity of community women's groups, centered around monthly weighing and plotting on a weight chart the growth of children. Nutritional advice and locally supported feeding along with management of diarrhea with fluids and continued feeding were central elements of this recurring village activity. By the 1990s, there were 240,000 of these volunteer-run village posts for up to 100 households each. The main activity has been monthly growth monitoring and attention to nutrition, but they have also been used for other preventive activities like EPI and the six monthly vitamin A distribution. Groups of volunteers (*kaders*) are trained to supervise the activities. One consistent activity of the *kaders* over 30 years has been the provision of ORS packets and instruction of mothers in the nutritional management of diarrhea in children.

The other health care resource at community level is the *Bidan desa* (village midwife). About 60,000 of them have been trained in the past 15 years. Their primary role is in midwifery care, but they also provide basic child health care and are responsible for supervising and supporting the *kaders* in the *Posyandus*.

Secondary and tertiary care and most inpatient care are provided at district and provincial hospitals. District hospitals can be found in most districts and generally have the four main specialty services.

Private health care services are becoming increasingly important in Indonesia, and may account for up to 70 percent of health care expenditures. Urban areas are seeing

increasing numbers of private hospitals and polyclinics of varying size. Many doctors and nurses have their own private clinics in the afternoons and evenings, and about 70 percent have a morning government job as a health worker or another kind of job. The other important part of the private health care is the network of pharmacies and drugstores. Many patients go there directly and can purchase any kind of drug, apart from narcotics, without a prescription.

Since 2003 the management of district health services, along with many other government functions, has been devolved to district (*Kabupaten*) and municipal governments. They receive a basic grant from the central government, which they budget along with any locally-raised revenues to provide all the various services. In health, that includes hiring staff and the running costs of the health facilities. The central Ministry of Health provides limited *deconcentration* funding and certain very essential drugs and biologicals for public health programs. The MOH also contracts health professionals for between one to three years to ensure the staffing of health facilities in more remote areas and in poorer districts. Under present decentralization laws, there is very little accountability of district governments to central ministries, and even basic reporting systems have not been functioning above the district level.

4.2 Diarrhea Case Management

4.2.1 Diarrhea management in the community

Diarrhea remains a common illness. Despite many societal changes, diarrhea morbidity rates have remained largely unchanged over the past four decades. It is widely recognized as an important condition and still accounts for 40,000 childhood deaths each year. Previously (and to some extent still today), diarrhea was felt to be an unavoidable concomitant to growth. Thus in the villages, diarrhea is first treated with additional fluids—most are herbal, coconut water, dark tea, chicken soup, or LGG (Larutan Gula Garam/sugar–salt solution), and food is continued and often softened (for example, banana *ayam*). Homemade fluids are often given first because of the unfamiliar taste of ORS, a lack of thirst in early stage diarrhea, and lack of availability of ORS packets in some instances. Home fluid solution has been widespread in Indonesia since the mid-1970's. Several studies on varieties of home fluids have been conducted with teaching modules and medical service standards incorporated in the promotion of home fluids. Fasting is virtually never seen any more.

As the majority of mothers with young children attend monthly *Posyandu* to weigh their children (attendance is in excess of 80 percent each month in Yogyakarta, though less in other areas) and receive health education, they have been drilled numerous times on the proper management of diarrhea with fluids, which is widely accepted.

While village *kaders* often have ORS or suggest LGG, most mothers have already tried these and if concerned by severity or persistence of diarrhea, seek help at the *Bidan* or *Puskesmas* or, if affordable, a private doctor. As government facilities are open for only a few hours in the morning, cases that are worrisome at other hours seek care in the private sector.

4.2.2 Outpatient care for diarrhea

As already noted, about half of children with diarrhea are taken for care to a health provider. When parents seek care outside the home for a child with diarrhea, they have already been giving extra fluids, home fluid solution, or ORS at home. At this stage they seem concerned about the persistence of the diarrhea or other symptoms like vomiting, fever, or respiratory tract symptoms, and are looking for a treatment to stop the diarrhea or other symptoms.

ORS packets can be bought in virtually every *apotik*, *toko obat*, and in many village shops, but most caretakers want something different. Kaopectate, branded drugs like Enterostop® and Diarstop®, and packaged herbal drugs for dissolution in water, lactobacillus, and smectite are commonly recommended. The team was regularly offered antibiotics when seeking advice for a child sick with diarrhea and often had to ask about ORS before the salesperson offered either the packet of salts or the readymade solution. Since ORS is so prevalent in Indonesia, it is often not considered *obat* or medicine. When the private sector recommends ORS, it is usually the much more expensive Pedialyte® and Pharmolit® (a flavored ORS). Home fluid solutions are considered more palatable and available at any time.

Diarrhea comprises up to half of outpatient visits and hospitalizations, exceeded only by upper respiratory symptoms (which only rarely progress to pneumonia) for outpatient care. About one in five diarrhea cases seek care in the public health system (assuming one case/child <5/year) making it the second most common complaint seen. Doctors in the public health facilities admit to a lot of pressure from caretakers for anti-diarrheals or antibiotics. In private practice, the expectations are for branded drugs and even injections. Midwives treating sick children in both public and private practice follow the doctors' standard practices. A study in Central Java showed that antibiotics and anti-diarrheals were given to most diarrhea patients treated by doctors, but because nurses are not permitted to write prescriptions, their patients do not receive these medications.

There is an ample ORS supply in provincial, *Kabupaten* depots, and most usually at *Puskesmas*, although there is less in *Pustus*, *Polindes* and *Posyandus*. Supply comes without being requested from the center and seems to be excessive in many places, although it could be distributed to *Posyandus* to good effect rather than left to expire. LoORS is generally available in shops and the health system, but the old WHO composition is still found. The low price (Rp 500) makes it available but not attractive as a treatment. "What costs less is worth less!"

4.2.3 Inpatient care for diarrhea

Diarrhea cases occupy up to half the beds in pediatric wards of hospitals and of those *Puskesmas* with beds. Cases are hospitalized if any dehydration is recognized or if diarrhea continues for several days, especially if accompanied by vomiting and the mother seems worried about continued treatment at home. Hospital treatment invariably involves use of IV Ringers Lactate (a far better choice of fluids than the previous use of 5% dextrose in water), and various benign anti-diarrheals (lactobacillus, kaopectate) are often added in hospital. Additional symptoms were said to occur in over 60 percent of children with diarrhea to justify the high rates of broad-spectrum antibiotics like Cotrimoxazole. For infants and babies, various infant formula brands are also provided, as promoted by the infant formula companies, though breastfeeding is said to be encouraged. Deaths are rare, at less than 1/1,000 cases seen in the health system.

There seem to be no rehydration corners any more in either hospital outpatient departments or *Puskesmas*, though many recalled having them in the past (the exception is at the teaching hospital at University Gadjja Mada where the ORT corner is the center piece of case management). Consideration should be given to their re-introduction, especially in hospitals where overuse of IV is widespread and costly.

4.3 Indonesian Experience of Zinc Treatment in Programs

Following the Aceh disaster, when substantial diarrhea was seen, HKI and the DepKes introduced zinc dispersible tablets in doses of 20 mgm for 10 days along with low osmolarity ORS as treatment for acute diarrhea. Field monitoring showed this was well accepted and generally taken as instructed. Some mothers have asked how they can purchase it, as it seemed to be not reliably available in the health system. A price of Rp3500 (the price of a bottle of medicine in syrup form) would be acceptable.

Complaints encountered included: the tablet seeming too large for a child (although it was to be dissolved in a large spoon of water), mothers forgetting how to dissolve and administer, and incomplete consumption of the full 10-tablet course of treatment. No complaints of untoward effects were found on interviews with mothers. In general, *Bidans* tended to give the zinc in addition to their usual practice of antibiotics and anti-diarrheals, which they felt were still necessary. While the nurses had read the HKI training brochures, often the doctors had not.

There are a variety of ways that *Bidans* are currently using to encourage mothers to take the full 10-day treatment for zinc. Some advised the mothers that it helps the child avoid getting diarrhea for up to three months. Others say that zinc replaces the minerals that are lost during diarrhea. Some explain to mothers that zinc is not a drug, it's a multivitamin to recover health that makes the child stronger and healthier. Still others say that it restores the child's health by replacing lost body fluids. Although some people are doubtful that a caretaker will continue giving the zinc once the diarrhea has stopped and the child's symptoms are "cured," many *Bidans* thought that this could be managed through coaxing and explaining to the mother about the health benefits to the child when the full 10-day course of treatment is completed. This variety of approaches and the absence of any evidence on their outcomes suggest that before the nationwide launching of zinc therapy, there is the need for some operations/market research to establish the most effective as well the most accurate messages to explain the importance of taking the zinc tablets for the full 10 days.

More recently, following the earthquake in Yogyakarta in May 2006, some 4,000 courses of zinc were provided through the *Puskesmas* system. The author visited homes of mothers whose children had recently been given zinc and found it was accepted enthusiastically. In a local outbreak of 154 cases in Bantul in late 2006, all had received zinc and felt that it shortened the disease and made the child stronger in recovery. Doctors, *Bidans*, and *kaders* alike were positive about it as it satisfied the expressed need for a *medicine*, in addition to ORS. A substantial reduction in the use of antibiotics and anti-diarrheals was reported. Doctors in one center reported a "scratchy throat" complaint by one child, but all said that the zinc was readily consumed for the 10-day course. Health workers were anxious to obtain more zinc to make it a part of routine treatment.

5. Health Promotion and Behavior Change

5.1 Overview

Care-seeking practices and decision making for the treatment of children with diarrhea are more complex than meets the eye. Behaviors are influenced by many different factors, some internal to the individual and some external. It is important to understand these influences so that health promotion strategies and approaches get at the key concerns and issues of the target audience and facilitate the adoption of new behaviors. Likewise, influencing health-seeking practices at any kind of scale often requires coordinated solutions at the individual, community, institutional, and policy levels. Lessons learned from the private sector suggest that the potential to positively influence behavior change is so much richer when interventions are based on an in-depth understanding of the beneficiary's knowledge, beliefs, and practices about the health behavior(s) to be promoted. It is likewise important to understand who and what influences those behaviors, what people want and need for their child's health (not simply telling them that it's "good for them"), and anticipating potential obstacles that might affect a decision to try and finally adopt a new health practice or behavior.

The promotion of zinc and low-osmolarity ORS as the gold standard for treating diarrhea will require the engagement of multiple audiences from the upper echelons of the MOH, to service providers in both the private and public sectors, to medical representatives and industry, to volunteers and *kaders*, and to the "beneficiary" or caretaker in the home, to name but a few. Message consistency and accuracy across a variety of media and approaches, adapted for the broad range of audiences anticipated to be directly or indirectly involved in the promotion of zinc and low-osmolarity ORS, will be of paramount importance. Otherwise, and despite the best of intentions, the new products and diarrhea case management protocols or the *big three*—zinc, ORS/ORT, and continued feeding—may never receive the recognition and attention needed to become entrenched as the preferred choice of treatment for young children with diarrhea in Indonesia.

5.2 Influences on practice in diarrheal case management

The patterns of care described in the previous chapter were found to be remarkably uniform in the different regions of the country that the assessment team visited. There is clearly a great deal of respect for what doctors and other health workers advise. But at the same time, doctors tell sufficient stories of explicit demands made by caretakers seeking alternative sources for the treatment they expect; there is little doubt about the effect of the expectations of caretakers when going to a health worker or to hospital, and the very strong influence that these expectations have on what is done. Nevertheless, there are clearly a variety of professional influences that are also important for health workers of different types.

For health administrators and hospital staff, national policy is important. Several senior staff said that they would be very happy to implement zinc therapy as soon as the policy directive was received. Clinical standards have been agreed and recorded for both hospitals and *Puskesmas*, but the team found that they were more significant in hospitals where performance according to approved clinical standards is part of a national accreditation process for hospitals.

Professional respect is important. Doctors in both public and private practice referred to their teachers and what they were taught as the guidelines for their practice. Nurses and *Bidans* are most affected by what they see doctors prescribe, and this seems to be true in drugstores as well—they follow the lead of the doctor despite any information they get from DepKes. Thus, the doctor is *key* to behavior change. While some *Bidans* are visited by detail men to push products, virtually all doctors are visited with an array of incentives to use the drugs suggested (some quite munificent!). Unfortunately, the general practitioners in public facilities and particularly those only in private practice are the ones with least access to quality, evidence-based information on up-to-date good practice. Pediatricians and other specialists have active associations and regular journals; the midwives have an active association (see below); but general practitioners as a whole seem to make less use of their journal and educational meetings.

IMCI has been widely introduced throughout the health system. Many of those with whom the team spoke who had been through IMCI training seemed to be more aware of the problems of providing anti-diarrheals and antibiotics than those who had not. Some said they had tried, sometimes successfully, to give vitamins instead of antibiotics. The first IMCI training was in 1997. It was adapted into medical school curricula in 1998 and into the nursing and three-year midwifery training curricula in 2000. A six-day (plus evenings) course was added to the original 11-day, in-service training course in 1999, and both courses are still being used. Early evaluations demonstrated (as has been found elsewhere) that the follow-up supervision was more important than the length of the initial course. The supervision system seems to have largely collapsed since decentralization in 2003. A similar five-day course was developed for the *Bidan desa*, which had a simpler algorithm. This has subsequently been abandoned because of confusion developing between the two algorithms when the *Bidans* were working in *Puskesmas*.

All provinces in Indonesia are implementing IMCI. Participating districts seem to have an IMCI trainer (pediatrician) at the district hospital and some facilitators (usually *Puskesmas* general practitioners) as the training team, and training is provided to teams of a doctor, nurse, and midwife from *Puskesmas* in the district. WHO believes that it is being implemented by about 60 percent of districts and about 30-40 percent of the 7,000 to 8,000 *Puskesmas*. However, the team saw no evidence of IMCI wall charts or patient records being used in any of the health facilities visited except at the University Hospital of Gadjah Mada. District administrators point out that many of the doctors who are trained are contract staff, who only stay for three years and then move on to private practice or other places. The actual status of IMCI at this time is uncertain, but a national evaluation will take place later in 2007, sponsored by USAID and the Government of Indonesia.

The other institution that is having a profound impact on quality of health services in Indonesia is the Indonesian Midwives Association (IBI). Three particular activities seem to be important at this time. The first is the promotion of regular meetings among the members. All members are encouraged to meet monthly at a sub-district level. Meetings often address issues of conditions of service, but they are also used for continuing education. The sub-district supervisors meet quarterly at the district level for business and training. The second significant activity is the promotion of the three-year midwifery diploma for the 50,000 *Bidan desa* trained in the 1990s, who have only had the one-year diploma. There are waiting lists for the training despite the fact that the midwives have to pay for it themselves. To meet this need, the number of training schools is being increased. The third important activity is the recent development of the *Bidan Delima*

program. This is a franchise system of private midwives, which requires special training and accreditation of the midwives and their facilities according to agreed standards, with re-accreditation being required every three years. The training manuals prepared for this program are now becoming widely available to midwives who have not been accepted to the program, but who wish to have quality reference materials. Unfortunately, while the focus of the program is, appropriately, on midwifery, it does not yet adequately address the child health needs that many of these midwives are also involved in. The association leadership in Jakarta are very interested in participating in the promotion of zinc and improved management of diarrhea, and wished to be able to work closely with the Zinc Task Force to actively participate in the design, implementation, and evaluation of a national strategy to promote its use.

5.3 Health promotion: challenges and opportunities

5.3.1 National level

At the national level, Health Promotion in the Ministry of Health has approximately 60 professional staff that are assigned to three divisions including: 1) Partnership and Community Participation; 2) Equipment and Technology; and, 3) Exhibition and Technology. Examples of their numerous responsibilities and programs include: *Desa Siaga* or the Alert Village Program; Living Healthy Lives (PHBS or *Perilaku Hidup Bersih and Sehat*: the promotion of 10 healthy life practices); and the annual preparation of kits with health messages, materials, and guidelines for the provinces. Health Promotion also does educational videos, television, and radio.

Other Ministry of Health sub-directorates also design and produce health promotion materials relevant to their different areas of responsibility. Health Promotion may or may not be invited to help them with materials development. MCH, School Health, Nutrition and the different sections of Disease Control all produce different materials. Various types of print materials, particularly posters on avian flu and dengue, have been distributed by the central level and are prominently displayed in a variety of settings including hospitals, *Puskesmas* and *Posyandus*, and sometimes private pharmacies. Nutrition has a large display area with dozens of posters, pamphlets, and booklets on nutrition issues including ones on zinc and diarrhea developed with HKI. Flipcharts, counseling cards, and other materials that would facilitate dialogue or serve as teaching aids are less common, although they do exist. Materials from all of these units are distributed to the provinces, which are responsible for getting them to the districts. The districts, in turn, are charged with getting them to the hospitals, *Puskesmas*, and *Posyandus*, as appropriate.

5.3.2 Provincial level

At present, at the Provincial Health Office level, the bulk of the budget is to promote general healthier living practices (PHBS), and the budget is very clear for what it can be used for. Some indicated that they would like more flexibility to do other things. For example, if there is an outbreak in some area of the province, there is no budget available for health promotion that would allow them to address the problem.

A wide variety of posters and brochures are produced and/or stocked at the provincial level, including youth and healthy life styles, bird flu, dangers of smoking, *Desa Siaga*, PHBS, nutrition, and so on. Content for the materials is provided by the different technical divisions such as MCH, Communicable Diseases, or Environment. The

provinces are encouraged to adapt the materials and messages that they receive from the national level so that they reflect the needs and interests of the area or region. Training is provided from the national level to facilitate this process, although provincial staff admitted that it is often “easier” and less costly for them to use what the national level has provided.

It is not clear if there are opportunities for pre-testing materials with target audiences and refining messages and images based on feedback before printing. Opportunities to monitor how well the materials/messages are understood or how they are being used is the responsibility of the technical divisions, not health promotion. HKI and HSP are both working on enhancing the ability of the provinces to adapt and produce their own health promotion materials that will most probably address some of these issues. In addition to print, health promotion at this level uses seminars, interactive television, and press conferences to build awareness on various health themes.

5.3.3. District level

The province sends out directives to the districts on what to do for special health days like *Desa Siaga*, which was the theme for the 2006 National Health Day. District level Health Promotion Departments also have staff that work on community development, schools, and materials development. In some areas they are also responsible for training the *kader* and getting materials out to the *Puskesmas*. Some districts report that not much health promotion work takes place at the *Puskesmas*. In fact, many of the materials seen at provincial level were rarely, if ever, seen at the *Puskesmas* or *Posyandus* visited. Boxes of materials are typically dropped off at district health offices from the provincial offices and are then supposed to be distributed to the *Puskesmas* for further distribution to *Bidan desas* and *Posyandus*. Clearly, only major national programs receive sufficient attention, transport, and coordination to succeed in getting materials to all the peripheral sites.

Poster themes seen at one or more of the *Puskesmas* included dengue, avian flu, acute flaccid paralysis, marasmus and kwashiorkor, TB, filariasis, and leprosy. The design of the posters and the amount of information presented suggests that they are intended to provide information to service providers rather than be used as educational supports to stimulate group health talks or counseling. In Aceh, the HKI poster, stickers, and sometimes the informational brochure on zinc and ORS were seen regularly at the district level offices and *Puskesmas*. The flipchart, on the other hand, has only been partially distributed to the *kaders* through the *Bidans*. Health talks in the *Puskesmas* are generally done about once a week for 10–15 minutes when people come for immunizations.

5.3.4 *Posyandu* and *Desa Siaga*

The *Posyandu* system continues to operate successfully in many areas of the country. Once a month, volunteers weigh as many as 50–90 percent of all the children in their area. In the years following the economic crisis of the late 1990s, this activity also formed the basis of food supplement distribution schemes to needy families. August and February are considered the best months for weighing children since that is when Vitamin A is distributed. Although nutrition surveillance is the major purpose for the *Posyandu*, *kaders* are trained to handle other activities such as distributing Oralit® for children with diarrhea and iron/folate tablets to pregnant women. They are also expected to do some health promotion, although they have very few tools to help them with this

work, particularly in nutrition counseling. *Posyandu* meetings are also used as opportunities for the EPI teams from the *Puskesmas* to do routine immunizations.

The *Desa Siaga* or “Alert Village” Program is being initiated in the same areas as the *Posyandus*. The two approaches are expected to complement one another. In response to the series of natural disasters in recent years, the *Desa Siaga*’s purpose is to promote improved emergency preparedness and control of communicable diseases at the community level. An additional goal is to ensure that routine child and maternal health services are more accessible and available to communities on a continuous basis. *Desa Siaga* are staffed by a *Bidan desa* (village midwife) and two *kaders* who are available around the clock. Twice a month a doctor from the *Puskesmas* is scheduled to visit the village *Poskesdes* and provide services (eventually, this is supposed to be twice a week). Although some concerns were expressed that the new *kaders* involved with the *Desa Siaga* would be receiving some payment from the MOH, while *kaders* involved with the *Posyandu* would continue as volunteers, it was later explained that the *Posyandus* will be receiving 50,000 rupiah per month to help them with operating costs. How this money is spent will be up to the *Posyandu*.

Health promotion people do not have information about the type of training that is being provided to *Desa Siaga kaders* and *Bidan desa* since, as they explained, that is the responsibility of the PHO training department. *Kaders* through both programs would be ideal agents for promoting and offering zinc and ORS for home-based care of diarrhea as well as reinforcing messages about the importance of continued feeding, breastfeeding, and hand washing with soap.

6. Pharmaceutical Management

6.1 Policy and regulation

In 2007, Indonesia released the latest edition of the National Drug Policy, which covered all aspects of pharmaceutical management. The National Agency of Food and Drug Control (*Badan POM*) has the responsibility for the administration of the full spectrum of regulatory activities. The new low osmolarity ORS is registered by NAFDC, however, zinc as a therapeutic product with an indication for the management of diarrhea is not yet registered.

Badan POM confirmed that the standard procedure takes about six months to register a new product, but guaranteed that there is a fast-track approval procedure that can be employed to accelerate the two-month preregistration stage. This procedure requires either the publication of the new zinc therapy policy by the Minister for Health or a demand letter from the Ministry of Health (Disease Control General Directorate) to manufacturers indicating that zinc therapy will be part of the new program for diarrhea case management and directing them to send dossiers to *Badan POM* for the registration of appropriate zinc products.

Badan POM can also provide support for the unbiased labeling of zinc products and the provision of zinc-related drug information through the National Drug Information Center (NDIC) in Jakarta and the *Balai Besar POM* at some of the provinces. This will help to provide the public and private health care workers and consumers with reliable and unbiased information on the use of drugs for the management of diarrhea.

6.2 Selection

The latest edition of the National Essential Medicines List (*Daftar Obat Esensial Nasional, DOEN*) was published in 2005, and already contains the new recommended low osmolarity ORS. The Directorate of Pharmaceutical Services confirmed that the next review is due in 2008. The 2008 review will provide an opportunity for the inclusion of zinc as indicated for diarrhea. Meanwhile, the publication of the Ministerial decree on the new clinical management of diarrhea will automatically trigger a circular for the inclusion of zinc in the *DOEN*. The standard treatment guideline for *Puskesmas* (*Pedoman Pengobatan Dasar Di Puskesmas*) was last published in 2002 and is due for review in 2007. This revision should include the new guidelines for the management of diarrhea. Another document—the *Pedoman Informasi Obat bagi Pengelola Obat di Puskesmas*—may need to be updated to include information on the new clinical management of diarrhea.

There has not been a drug utilization review in the past two years. There is no readily available consumption data on anti-diarrhea and antibiotics for the management of nonspecific diarrhea. The Directorate of Rational Use appears very willing to work with the CDC to help in conducting drug utilization studies on diarrhea medicines and in monitoring the rational use of this zinc therapy.

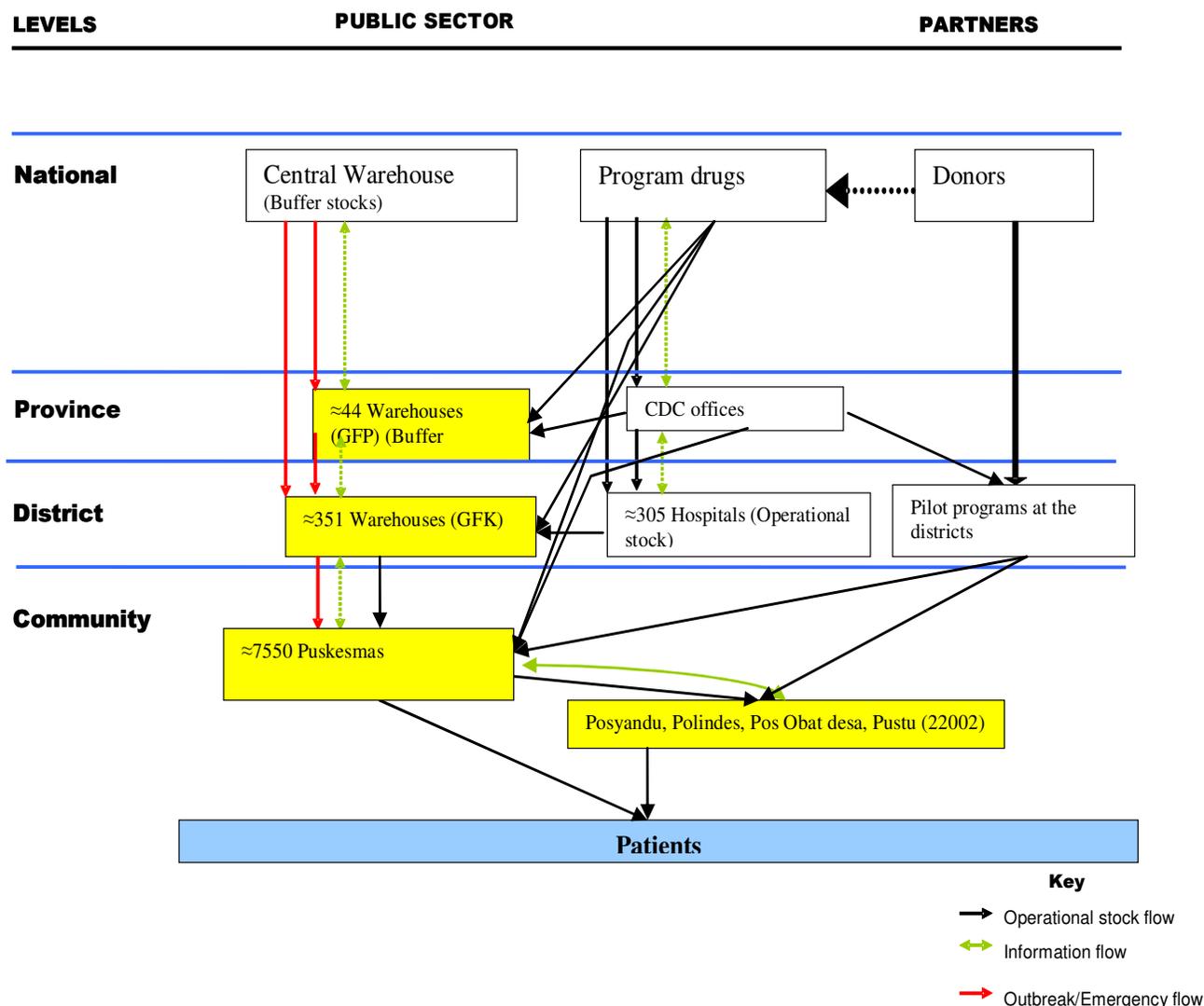
6.3 Quantification, procurement, and distribution

Many different institutions conduct procurement independently—BinFar, the national MOH directorates, district pharmaceutical offices, warehouses, and hospitals. A lack of coordination among these actors has resulted in both excesses and gaps in the supply system. The center is responsible for buffer stocks of the “very, very essential drug list” (vvEDL). This buffer is supposed to be about 3 percent of national drug needs of the vvEDL and is used during emergency periods and for stock-outs in provinces and districts. The provinces are responsible for the “very essential drug list” (vEDL). The provinces together should keep about 10 percent of the national need of the vEDL as buffer to cover stock-outs and emergencies. Each district is responsible for its own operational stocks. These include all medicines in the essential drug list (EDL). They are purchased through an annual tender process and are distributed to the *Puskesmas*, *Pustus*, and *Bidans* at regular intervals throughout the year. District hospitals have a separate budget and procure independently throughout the year. The autonomy of each district seems to make it difficult to exploit opportunities for pooled procurement involving a collection of districts.

There are currently about 13 vertical health programs in the MOH. The national directorates and sub-directorates responsible for these programs procure and distribute the drugs required independently of the districts. This independent procurement and distribution by the vertical programs has resulted in some instances in both overstocking and gaps in the supply chain at the district level. Of the 52 drugs listed to be provided by the vertical programs, 12 are not classified and 19 medicines (32%) do not have a clear vertical program that provides them. Also, of the 59 drugs listed in the vvEDL, it is not clear which program is responsible to supply 24 (41%) of them. This pattern of multiple procurement sources has also resulted in very complex distribution channels (table 7 presents a schematic representation of the distribution channel). The introduction of zinc will require better coordination with clear statements on which quantities the Diarrhea Sub-Directorate will provide and what is expected from the districts.

Much of the problem leading to excesses and stock-outs results from the failure to pool information and coordinate procurement. Provinces, districts, and facilities throughout the areas visited have good data collection practices through the use of the *Laporan Pemakaian Dan Lembar Permintaan Obat* (LPLPO) system. Stock cards are in use in most of the warehouses visited. Quantification at the province and district levels is done using the consumption method rather than the preferred morbidity-based quantification method. However, the main problems were the lack of a forum where the district team could discuss issues related to quantification and procurement of medicines and the failure to send the available data on medicine use from districts to provinces or from the provinces to the center. The coordination, standardization of data elements, and upstream data reporting all need to be strengthened. Since the National CDC Directorate has several vertical programs with significant drug supply responsibilities, there might be considerable advantage in having someone with specific responsibility for commodity tracking, whose job it is to compile data on numbers of cases treated and quantities of drugs distributed and used from the districts and provinces. At the province and district levels, there is a need for improved coordination between the pharmaceutical offices and the CDC (and other vertical) programs. Training on the morbidity method of quantification is recommended to improve the quality of estimates for supplies of zinc and other drugs.

Table 1: Schematic representation of the public sector distribution channels



It is estimated that the budget per year for the provision of zinc is Rp31.4 billion (US\$3.5 million). This assumes a total incremental cost per treatment of about US\$0.47 (Rp4,183), representing the costs of both zinc and handling and distribution²⁰. It also assumes that an estimated 7.5 million/yr diarrhea cases will seek care outside home at a government facility or from a government worker.²¹ The cost of provision for the respective districts can be calculated using the diarrhea prevalence in those districts, assuming that one-fourth will consult a government health care worker, then multiplying by the zinc total incremental costs of Rp4,183.

²⁰ B. Robberstad, et al., "Cost-effectiveness of Zinc as Adjunct Therapy for Acute Childhood Diarrhea in Developing Countries," *Bulletin of the World Health Organization*, July 2004, 82 (7).

²¹ J. Rohde and I. Aitken, "A little over half of the 25 million to 30 million diarrhea cases in children will seek care outside the home. Assume a generous 50 percent will seek care from a government health worker." Communications on diarrhea case load in Indonesia, BASICS, 2007.

6.4 Inventory management and storage

Most of the provincial and district warehouses (*GFK* and *GFP*) visited have a good manual inventory management system with the use of stock cards, the LPLPO, and the first-expiry first-out (FEFO) system. One *GFK* has an electronic inventory management tool that was developed locally. The users confirmed that it has assisted them in better managing their stocks and in providing services to the *Puskesmas*. A review of the tool showed it has basic inventory management capabilities and produces limited reports.

Recommendations:

- The development of a standard inventory management tool for use in public health warehouses is recommended. This tool will have the capacity to generate some standard reports like the VEN and ABC classification (analysis of drug usage and health impact), delivery schedules, minimum and maximum stock values, and expiration date alerts. Few of the health centers (*Puskesmas*) visited had stock cards available.
- Adequate stock control strategies start from the lowest levels; the use of stock cards at the *Puskesmas* needs to be introduced.
- The storage condition of many of the warehouses visited needs to be improved. Most do not have adequate storage space, shelving, pallets, offices, refrigerators, and temperature monitors. Expired Oralit® was found and had not been removed from the warehouses or the *Puskesmas*. The storage constraints may impair adequate storage and inventory management of zinc when procured. It appears that the vertical programs also store medicines including vaccines separately. Vertical storage and distribution system results in lack of transparency and coordination.
- The “one-gate system” is recommended, whereby all drugs are managed through the *Kabupaten* warehouse.

6.5 Use

At most of the *Puskesmas* visited, the old Oralit® was in use in some facilities and in others, both old and new low osmolarity Oralit® were in use. It was not clear if the drug officers at the districts and *Puskesmas* understood the difference between the two compositions. Facilities were advised to stop further ordering of the old Oralit® and start using the new low osmolarity ORS.

Recommendation:

- There is a need to train pharmaceutical officers so they understand the new products recommended for the management of diarrhea.

Stock cards are mainly not in use in the *Puskesmas* visited. The implication of this is that the minimum and maximum stock levels can not be determined and consumption data on the use of medicines for diarrhea are not available. This affects opportunities for drug utilization reviews and information that would have provided for interventions to improve rational drug use.

Some of the *Puskesmas* visited have anti-diarrhea (Kaolin and Pectin) Diaform® available. Anti-diarrheals are not found in the DOEN and are not part of the WHO Essential Medicines List. It was not clear how the facility obtained the medicine. The standard guidelines including *Pedoman Informasi Obat bagi Pengelola Obat di Puskesmas* and the *Pedoman Pengobatan Dasar Di Puskesmas* were not available in

any of the *Puskesmas* visited. It appeared that neither the district pharmaceutical office nor the drug officer in the *Puskesmas* has the responsibility to monitor rational use and compliance to the guidelines.

Recommendation:

- The directorate of rational use should be equipped to work closely with the Diarrhea Program staff in monitoring rational use antibiotics and zinc, when introduced. This collaboration is also recommended for all vertical programs that include the introduction of new medicines particularly anti-infectives.

The dispensing practices at the *Puskesmas* for children observed shows that pediatric medicines are ground, added together as a powder, divided into dose sachets, and then given to caregivers. There is a concern that this same practice may be used for zinc.

Recommendations:

- *Puskesmas* drug officers need to be trained on how to administer zinc and mandated to demonstrate the dissolution of the tablet and its administration to caregivers before they leave the facility.
- Oralit corners were very successful in the past in educating mothers about ORS and ORT. The renovation and revitalization of Oralit corners could be a very valuable way to reinforce new messages about diarrhea case management and nutrition, as well as ensuring that mothers know how to dissolve the tablets and make sure that the child has the first dose of zinc before leaving the facility.

7. Private Sector Assessment

7.1 Pharmaceutical market analysis

The total pharmaceutical market in Indonesia in 2005 (according to IMS) amounted to Rp 23.608 billion or US\$ 2.62 billion. This is the largest market in South East Asia followed by the Philippines, Thailand, and Vietnam. The annual growth rate of the Indonesian market varied between a robust 13 and 20 percent over the past five years. The market is roughly split 60/40 between ethical (prescription) drugs and OTC products.

Table 1: Growth rate of the Indonesian pharmaceutical market, 2001-2005

In billions (rupiahs)	2001	2002	2003	2004	2005
Total market	12,850	15,483	17,566	20,873	23,608
Ethical market	7,891	9,618	10,882	12,706	14,647
% ethical	61.4	62.1	61.9	60.9	62.0
OTC market	4,959	5,865	6,684	8,166	8,961

The generic market share remains almost constant at approximately 11 percent of total market

Distribution of drugs

The pharmaceutical market is characterized by too many distributors with not enough retailers in the private sector. There are 2,450 distributors and wholesalers, but only 7,354 *Apotiks* and 11,979 *Toko Obats* (including approximately 5,000 unlicensed TOs.) Added to the above are some 90,000 *warungs* (stores) who sell over-the-counter and personal care products

According to the MOH database of 2003-2004, the public sector has a network of 7,071 *Puskesmas* (public health centers) and around 240,000 *Posyandus* (village posts manned by volunteers that administer basic health advice, growth monitoring, Vitamin A, ORS, and so on).

Typically, the distribution of drugs in Indonesia can be broken down as follows :

- Private pharmacies 25 percent
- *Toko Obats* 13 percent
- Hospitals 12 percent
- *Warung*/stores 25 percent
- Dispensing doctors/institutions: 25 percent

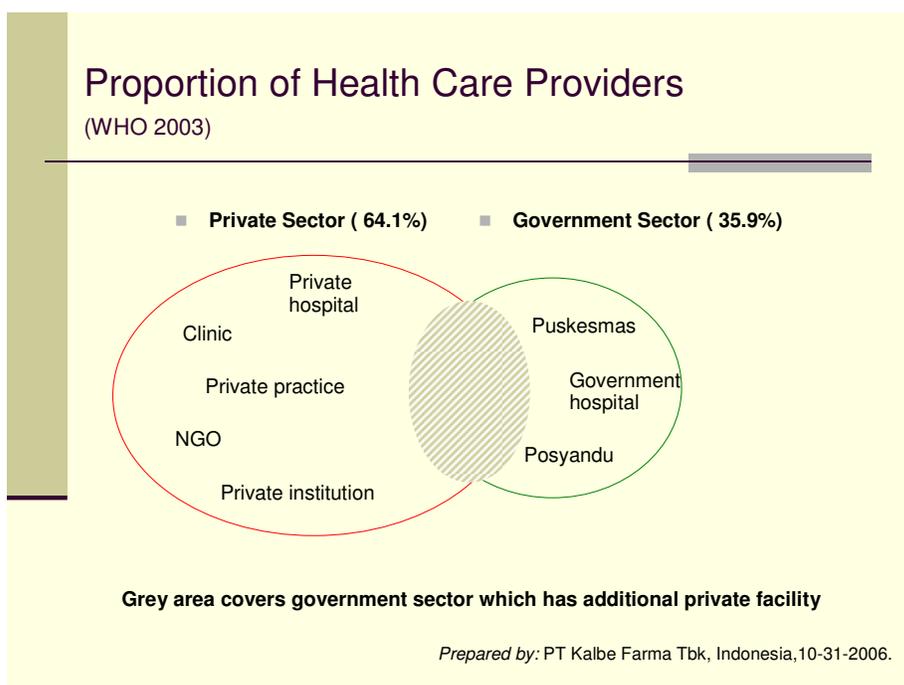
Price structure of Rx and OTC products

Ex-factory price to distributor:	100
Distributor price to retailer: + 15% =	115
Retailer price to consumer: +25 - 40% =	144 – 160

7.2 Health providers

There are 31,924 physicians, which represents 1 doctor for every 6,580 people. Two-thirds of health care is delivered through the private sector, though there is considerable overlap of providers between the government sector and private practices.

Figure 1: Proportion of health care providers in Indonesia



Health care services

The number of hospitals is limited to 1,280 with a total of 142,900 beds, which represents 0.68 beds per 1,000 people. Fifty-seven percent of hospitals belong to the private sector.

Only 14 percent of the total population is covered by health insurance with PT Askes, a state-owned company, serving the public sector (12%), and only 2 percent of the population is covered by the private health insurance. To improve this situation, the government has introduced a national social health insurance in the framework of a national social security system (SJSN)—Law No. 40/2004.

7.3 Diarrhea market situation

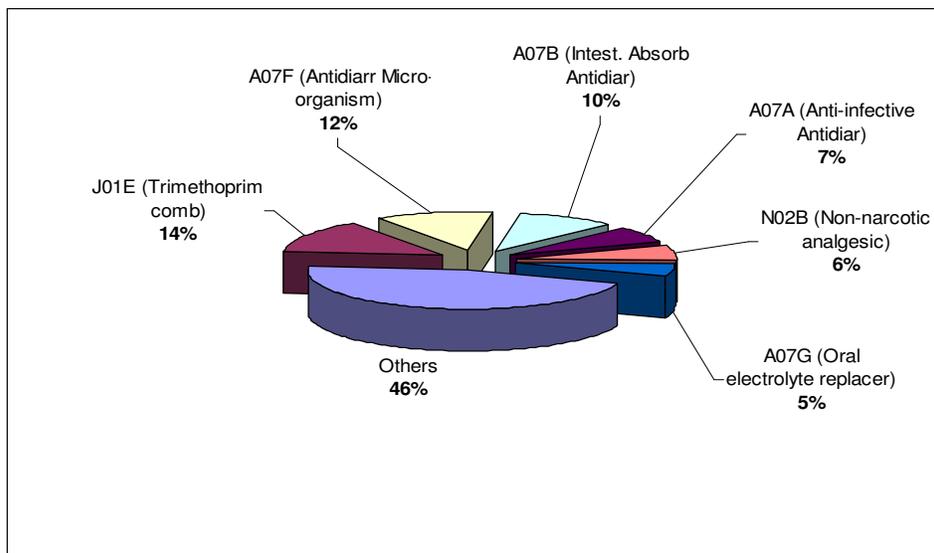
According to an audit of pharmaceutical prescriptions for the first semester of 2006 (IMDI), total diarrhea consultations are 4.8 million per annum, from which approximately three million are for children less than five years of age. Pediatricians see 43 percent of

patients with diarrhea, while the remaining 57 percent of cases of diarrhea in children are seen by general practitioners.

Diarrhea incidence remains at an average of 1.3 episodes per child per year with wide variations according to areas and seasonality. It is estimated that between 25 and 30 million cases of childhood diarrhea occur in Indonesia each year.

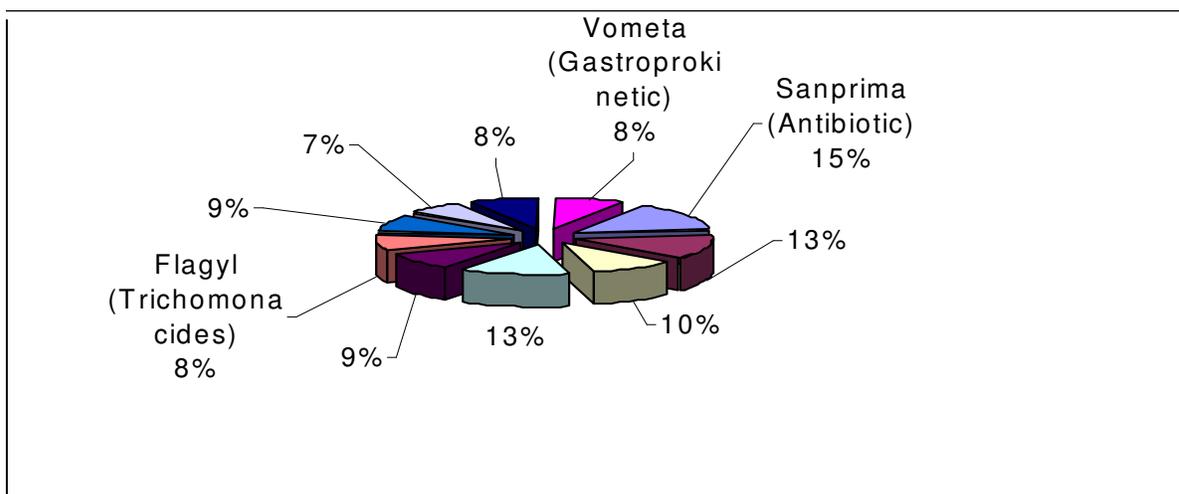
The private market for the treatment of diarrhea is estimated at approximately \$30 million, of which 22 percent is for children below age 5. Multiple prescriptions are often given for a single typical case. Below are the main categories of drugs sold through pharmacies.

Figure 2: Drugs given in diarrhea cases for children < 5 yrs (total cases)



Source: IMDI S1-06.

Figure 3: Top 10 drugs prescribed in diarrhea cases for children < 5 years
(total prescriptions)



Source: IMDI S1-06.

The top 10 drugs prescribed in diarrhea cases for children less than 5 years old are systemic antibacterials, absorbant, probiotic, electrolytes, and gastroprokinetics.

7.4 The pharmaceutical industry

The pharmaceutical industry in Indonesia is fragmented. It consists of about 200 companies. There are 35 foreign joint ventures and the remainder are domestic companies. Four companies are state-owned enterprises: Kimia Farma, Indofarma, Phapros, and Biopharma (biologicals, vaccines). The local private and state-owned companies dominate the market and represent 73 percent of the total market.

Assessment of major national pharmaceutical companies

In a prior visit with the International Zinc Task Force in September and October 2006, four drug companies were contacted to explore the potential for zinc production and marketing in Indonesia. These four companies, Kimia Farma, Kalbe Farma, Indo Farma, and Dexa Medica, confirmed their interest in zinc and have begun work to develop a product (please see C. Saadé's trip report of September 2006 for more information). The first two are developing in-house formulations for a dispersible tablet. The latter two prefer to import the technology from abroad as a more expedient way to introduce zinc.

During this visit, the team continued contact with the above companies that shared their respective progress in developing the product. The team visited five other major companies: Sanbe (based in Bandung), Tempo, Pharos/ Novell, Combiphar, and Interbat. No meeting could be arranged with Phapros (Semarang) and Konimex (Solo) during this visit, due to distance and the unavailability of management. However, a Phapros representative attended the assessment team debriefing at CDC on February 28.

Findings

Most of the companies visited expressed an interest in producing and marketing zinc. All were given standard information consisting of the WHO guidelines, USP specification guidelines for the manufacturing of oral solutions and dispersible tablets, and a bibliography of zinc clinical trials. They were also told of the strong support for zinc from both the MOH and the Indonesian Pediatric Association. All interested companies were invited to do their own feasibility studies.

Table 2: Pharmaceutical company rankings

Pharmaceutical Companies	Rank #	Disp. tab technology	Zinc interest	Marketing strength
Kalbe Farma	1	X	HRD* ready	Rx + OTC
Dexa Medica	2	X	Import	Rx
Sanbe Farma	3	X	Feasibility	Rx
Tempo	4	X	Feasibility	OTC
Pharos	6	X	Feasibility	Rx + OTC
Kimia Farma	7	X	HRD ready	Rx + OTC
Indo Farma	9		Import in 1st phase - HRD expected in April	Rx
Combiphar	Top 20		Feasibility	Rx
Interbat	Top 20		Feasibility	Rx + OTC

*HRD = Health Registration Dossier.

A more complete matrix on the companies' assessment is in appendix 13.

7.5 Issues and recommended actions

1. Enlist the private sector as the most cost-effective, fastest, and at-scale engine for the introduction of zinc for the treatment of diarrhea.

The pharmaceutical industry has the capability of producing a quality product, quickly distributing it nationwide, and promoting it to most health professionals. To do so, they must perceive zinc as a business opportunity that needs to be developed through their own distribution and marketing resources.

Action: Convince decision makers in key companies to treat zinc as a promising product with considerable market potential if they can create active demand for it. Both health professionals and caregivers in Indonesia want a "treatment" for diarrhea. Zinc needs to be introduced as a new concept for the treatment of diarrhea.

2. Ensure a level playing field among all companies

The companies visited expressed an interest in zinc marketing because of the interpersonal contact with key decision makers. However, other companies could be

interested as well and should be made aware of this opportunity. Increased interest will lead to competition and ultimately higher demand generation, broader coverage, and lower prices.

Action: Publicize MOH's interest in ensuring zinc is available for treatment of children with diarrhea. The MOH/CDC Zinc Task Force will send an announcement letter to all national companies through the National Pharmaceutical Manufacturing Association. Follow-up action will be needed to retain the interest of target companies, especially those who actively reach the base of the pyramid (see appendix 14 for market segmentation by company).

3. Accelerate registration of zinc as a drug (Rx and OTC).

The key to early availability of zinc is the health registration approval process for a therapeutic agent, which takes between 6 and 12 months after submission of the dossier. Registering zinc as a food supplement, which could occur in four months, would be considered unethical if later the company claims therapeutic properties.

Action: Obtain a ministerial decree confirming the importance of zinc for the treatment of diarrhea and its inclusion in the national guidelines as a program requirement. Submitting the document to *Badan POM* (the Health Regulatory agency) will speed up the registration process by putting it on a fast track that will decrease the registration process to approximately six months. At least two companies were ready to submit a Health Registration Dossier in March 2007. Companies should be encouraged to introduce the familiar syrup form, until they master the dispersible tablet technology. Under these conditions Indonesia could see its first zinc brand on the market before the end of 2007.

4. Create positive competition among partners (intensity and reach).

Companies can delay and suppress interest from other companies if no one takes the lead in developing the market.

Action: Instigate interest among two or three market leaders to invest in demand generation and reap the benefits of the "initiator." Then quickly help develop market niches in which each becomes a leader. Other companies will enter the market as it develops.

5. Reinforce a common public health message.

The private sector thrives by promoting the uniqueness and highlighting the advantages of its product over the competition. On occasion the private sector exaggerates claims concerning the product's advantages and benefits. This would negatively affect the expectations from zinc's benefits in its evidence-based indication for diarrhea treatment.

Action: As soon as possible in the pre-launch stage, the promotion strategy should be formulated as a repetition and reinforcement of the public health message. The core message should include the three elements of the rational management of diarrhea: ORT + feeding + zinc. The creative work should respect the integrity of the

public health message. Companies should be guided to promote the zinc message in accordance with the public sector guidelines.

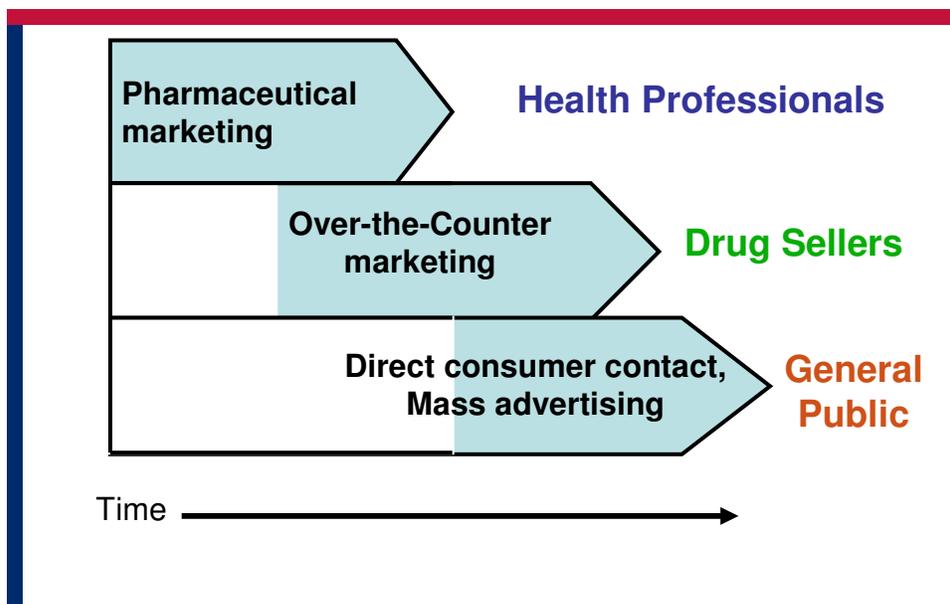
6. Sustain the marketing effort over time.

Initial enthusiasm is short-lived as most fast-growing companies introduce several new products every year. Zinc will be supplanted by other new introductions and be prematurely relegated as a low promotion product.

Action: Convince companies of a multi-phase useful life for zinc, starting with ethical promotion to health professionals, then shifting to a more OTC-type promotion to drug sellers, and finally switching to a mass promotion to the general public, along with the government training and educational efforts. A catalyst with a national perspective could help streamline the zinc brand in the appropriate business units of the partner companies.

Figure 4: Sustainable zinc marketing strategy

Sustainable Marketing Strategy for Zinc



7. Optimize the synergy of resources by building a public–private Partnership.

Despite a positive attitude and environment conducive for the introduction of zinc, Indonesia could miss the opportunity to remain one of the leading countries in the control of diarrheal diseases if it does not benefit from its own lessons learned in introducing ORS and from other countries' experiences in introducing zinc.

Action: USAID could play a key role at a minimal cost and burden by recruiting a catalyst individual who knows the mode of operation of the pharmaceutical industry, is familiar with the public sector, and can build a sustainable public–private

partnership. Such a person will play a key coordinating role in the Zinc Task Force. A reference role would be the AED/POUZN one-person set up in India and Tanzania.

8. Recommendations of National Zinc Task Force for the Introduction of Zinc Therapy and Improvement of Diarrhea Case Management

At the meeting of the Zinc Task Force on February 28, 2007, the participants (see list in appendix 9) reviewed the findings of the Zinc Assessment Team (ZAT) and developed recommendations for next stages of the action program. Three groups discussed case management and behavioral change and one group discussed pharmaceutical management of zinc products. See appendix 11 for a summary of ZAT observations provided to participants.

The recommendations of the Task Force are as follows (three additional points added by the ZAT are marked with an asterisk):

1. Policy

1.1. Policy statement (*S. K. Menkes*) from the Minister of Health regarding inclusion of zinc therapy as part of the standard case management of diarrhea

This provides the basis for changing all other relevant policy documents, standards, and clinical guidelines. In particular, it places zinc among the Government of Indonesia's essential drugs and signals to the pharmaceutical industry that zinc is required by the public health services.

1.1.1. Inform all provincial staff in annual meetings.

1.1.2. Translate WHO/UNICEF Joint Statement on Clinical Management of Diarrhea to *Bahasa Indonesia*. This is a useful international policy document in support of the Indonesian policy that can be circulated among provincial and district health authorities.

Production of zinc tablets and syrup

1.2. *MOH/CDC General Directorate to send a letter announcing the new zinc therapy policy and the need for appropriate zinc products to all pharmaceutical companies through the National Pharmaceutical Manufacturers Association with a copy to *Badan POM*.

This will help to ensure the early availability of zinc tablets and syrup for two reasons:

- It ensures that all national pharmaceutical manufacturers are aware of the government's requirements for zinc and have the opportunity to manufacture zinc products.
- It will help to speed up the preregistration phase of the registration process for zinc products submitted by pharmaceutical companies.

2. Programs

2.1. Change all relevant clinical guidelines

2.1.1. Standards for medical services

- Hospitals, *Puskesmas*, *Bidan di desa*

2.1.2. MCH and nutrition

- MTBS (IMCI), malnutrition, growth charts, and MCH books

2.1.3. Include zinc in emergency procedures and lists of supplies.

2.2. Implementation strategy

2.2.1. Start with doctors and the midwives and nurses working under their supervision in health facilities—let them take ownership of the “new therapy.”

- Encourage *Kabupatens* and hospitals to purchase supplies for hospitals and *Puskesmas*.

2.2.2. After doctors have started using zinc, promote zinc to *Bidans* through the Midwives Association (IBI).

2.2.3. Next, promote OTC sales to public

2.2.4. *Posyandus*

- Inform and demonstrate to *kaders* so that they can support caretakers in the new case management of diarrhea (see promotion).
- *Desa Siaga* – Later, *kaders* should be suppliers of zinc as well as ORS.

2.3. Task Force to identify other members from relevant organizations and institutions to ensure broad-based implementation.

- Encourage full participation by national and international NGOs and faith-based organizations.

3. Professional Education

3.1. Focus on GPs

This is the largest, most influential, and most difficult to reach group of health professionals, especially those only in private practice.

3.1.1. Targeted promotion (detailing) to health professionals.

- Through appropriate detailing aid, explain evidence for benefits of zinc and low osmolarity ORS and disadvantages of antibiotics in management of diarrhea.
- Describe the new clinical protocol.
- Include quotes from Indonesian scientists and research.

3.1.2. Courses (including IMCI) and seminars

- Doctors need continuing education before re-registration—make diarrhea mandatory subject.
- Expensive, but find sponsorship from international donors for IMCI expansion or industry for local seminars.

3.2. The Midwives Association (IBI) to use its regular association meetings at district and sub-district levels to introduce the new diarrhea management.

- Use or adapt the material for health professionals (see 4.1.1).
- Start with *Bidans* working in *Puskesmas* and then train those working in *Pustus*, *Polindes* and private clinics.

4. Promotion

4.1. Ensure simple, effective promotion of good diarrhea management to caretakers.

4.1.1. Make a SIMPLE message—logo, slogan, jingle.

- For example: “TISAR” from *Tiga beSAR* (the “big three”) - ORT, zinc, and continued feeding.

4.2 Link zinc to low osmolarity ORS in all communications.

4.2.1 Poster—Involve an advertising agency to make them modern, catchy, attractive, and interesting.

- ORT, zinc, and continued feeding – the Big Three for diarrhea.
- Shows how dispersible zinc tablet or syrup is taken.
- Leave other details to a brochure with frequently-asked questions for professionals.

4.2.2 Renew the treatment/counseling corner (ORT corner).

- Rehydrate or just mix and taste the Oralit® if not dehydrated; give “home-based solution” to prevent dehydration.
- Demonstrate how to use the dispersible tablet of zinc.
- Give first dose of zinc in the clinic.
- Combine with nutrition counseling.

4.3 Engage the private sector

4.3.1 Encourage the industry to carry the program to produce, promote and distribute zinc in the private sector. Demand generation efforts have to be committed for a sustained period to influence current prescribing practices.

4.3.2 MOH/*Badan POM* Drug Information Center and Pediatric Association (IDAI) to provide guidance and scientific evidence in the design of industry’s promotional materials to maintain a uniform public health message on the “big three” in diarrhea management.

5. Supply of zinc tablets and syrup

5.1. Put zinc on the Essential Medicines List (DOEN) following S. K. Menkes on zinc therapy for diarrhea.

5.2. Coordinate zinc reporting and procurement across programs

5.2.1. *Train provincial and district pharmaceutical officers and district CDC officers in the use of the “morbidity method” of quantification.

5.2.2. *Combine and coordinate reporting of diarrhea morbidity, zinc, and ORS consumption at facility and district level.

5.2.3. Keep track of all supplies through “one-gate system.”

5.2.4. Remember the space limitations of the district supply houses.

5.3. Stop ordering the old formula Oralit®—all new orders must be low osmolarity ORS (LoORS)—older stocks at health facilities may be used until finished.

5.4. Train health facility staff to improve zinc inventory management (implement First Expiry, First Out).

5.4.1. Introduce stock cards at all facilities.

5.4.2. Produce a dispensing guide to diarrhea medicines.

5.5. Coordinate with BPOM on side effect and adverse drug reaction reporting.

5.6. Encourage rational drug use monitoring!

6. Address the basic problem at its roots

6.1. Despite the difficulty, try to control marketing practices of infant formula:

- Need a strong law: IDAI helped NGOs to put *teeth* in the law. A good one was framed, but since then has been badly weakened.

6.2. Avoid conflicts of interest: ethical practices.

6.3. Do NOT provide infant formula as nutrition.

6.4. Do NOT give infant formula in disasters.

9. Strategy and Next Steps for USAID Support

The Zink Task Force (ZTF) recommendations listed above involve action by a large number of actors. This is both a program strength and weakness to implement zinc therapy and improved diarrhea case management; a strength because diarrhea case management is a concern for so many agencies and sections of the Ministry of Health, and a weakness because failure by some partners to do their part may jeopardize the whole effort.

This section seeks to take the key ZTF recommendations and put them into the context of an overall implementation strategy and rough timeline. Leadership will come from the Ministry of Health, those most actively concerned in the professional associations, and from the pharmaceutical industry. Nevertheless, USAID can assist in providing technical assistance to the coordination process and support the preparation of informational, promotional and educational materials so that the implementation program can proceed in a coordinated fashion and have its best effect.

Past achievements and present realities suggest a clear strategy and series of next steps for the implementation of zinc therapy and the improvement of diarrhea case management. It recognizes that general practitioners in both public health facilities and private practice constitute the most important target group, both because they see the majority of children sick with diarrhea and because they have the greatest influence on paraprofessionals and drug salespersons who see most of the remaining cases. Information about new medical treatments comes from both medical authorities and the pharmaceutical industry. For the promotion of zinc therapy and improved diarrhea case management (TISAR/“Big Three”; zinc, new ORS, and continued feeding), the intention is to build a public–private partnership between the Ministry of Health and the pharmaceutical manufacturers.

Lessons learned

Indonesia has achieved a dramatic fall in deaths from diarrhea disease over the past three decades with mortality falling some 90 percent, even in the face of morbidity levels that are essentially unchanged. This achievement can be attributed to several clear factors:

- A. A strong pharmaceutical sector producing and promoting oral rehydration salts (ORS WHO formula) in a standard packet to make 200cc of rehydration fluid with outlets through government health facilities (free), medicine stores (very low price), over-the-counter outlets, and community health volunteers (posyandus and kaders), making ORS (Oralit®) universally available and known.
- B. Persistent and consistent messages to both the profession and the public in support of oral rehydration and continued feeding in response to diarrhea, extending from oral rehydration corners in all health facilities, to community demonstrations and even into schools (“Pojok Oralit” revitalization: “Pojok Diare/TISAR” (Tiga Besar) means: Oralit corner → changes to Pojok Diare/TISAR/Tiga Besar: zinc, new ORS, feeding).

- C. Government norms and standards, reinforced by professional societies in support of oral rehydration, supported by health information systems that report not only on cases treated, but also on use of Oralit® packets.
- D. The initiation of national rehydration seminars in 1972, reinforced every 2–3 years with national meetings documenting the continued improvement in diarrhea case management through local research and implementation, led largely by the Indonesian Pediatric Society and its special chapters in close collaboration with the Department of Health. Several hundred papers on practical aspects of diarrheal case management have been published, largely in Bahasa Indonesia.

This persistent comprehensive effort has led to almost universal use of ORS or home-based fluids as the normal management of diarrhea in children, both at home and in health facilities. In turn, this has resulted in a dramatic and sustained fall in diarrheal deaths and the concomitant fall in infant and young child mortality, of which Indonesia can be justly proud.

One problem in the program arose from the early registration and promotion of Oralit® as an over-the-counter product. This led many doctors to hold onto older, more “medical” therapies—particularly the use of intravenous rehydration and the prescription of drugs—most often antibiotics. The resulting paradox is that in Indonesia today, home care is more close to WHO recommendations than the care prescribed by many doctors. This problem can be avoided in the introduction of zinc.

9.1 A Strategy for Implementing Improved Case Management Of Diarrhea

9.1.1 Primary program target group

If zinc therapy is to become accepted as the preferred treatment for diarrhea in children and replace the current irrational use of antibiotics and anti-diarrheals, the implementation strategy needs to target the correct people in an appropriate way. General practitioners in public health facility outpatient and private clinics are the professionals who see the majority of cases of childhood diarrhea, and they have the greatest influence on the paraprofessionals and drug salespersons that see most of the rest of the cases. To ensure that zinc is understood as an important therapeutic agent in the management of diarrhea, it will be introduced through the general practitioners first, and to paraprofessionals and community workers later.

9.1.2 Professional reorientation

Health professionals in Indonesia are informed and influenced by three main sources: the Ministry of Health, the medical schools and professional associations, and the pharmaceutical industry through their medical representatives. This strategy will seek to combine the authority, scientific expertise, and teaching skills of the Ministry of Health and professional associations with the reach and energy of the industry detailing activities. This is a good time for medical representatives to promote their product based on scientific evidence (evidence-based medicine), which has just recently been introduced at the Third of Indonesian Pediatric Society Annual Scientific Meeting conducted in Yogyakarta.

Critical implementation steps include the following:

- A clear MOH policy statement on zinc therapy, low-osmolarity ORS, and continued feeding for children with diarrhea.
- An information pamphlet designed for and distributed to doctors and other health professionals by the Indonesian Pediatric and Medical Associations. This will summarize the evidence for each of the three components of good case management and against the use of anti-diarrheals and antibiotics, except where specifically indicated.
- A dialogue between drug companies producing zinc products and the Ministry of Health, Badan POM, and the Pediatric Association about promotional messages towards the health profession and the public. This is intended to persuade the companies to adopt the same message about the three important components of care for children with diarrhea as set out in the MOH policy and as supported by the evidence elaborated in the information pamphlet: zinc therapy, ORS, and continued feeding. These, it is hoped, will be the core message promoted by the medical representatives all over the country, to health workers, pharmacists and drug store salespersons alike.
- Educational activities sponsored by the Ministry of Health, the commercial partners, and the professional associations targeted first at general practitioners, then paraprofessionals to introduce the improved case management approach. These could be in the form of seminars, short courses, self-learning materials, and the like, and could be used as best meets people's needs in different circumstances.

9.1.3 Public awareness and education

Changing the expectations of the public about the appropriate treatment for childhood diarrhea is going to be particularly challenging because it involves the goal of substituting zinc for the anti-diarrheals and antibiotics that, although ineffective, everyone has come to believe in and rely upon. This is one of the reasons for providing health professionals with all the evidence and moral back-up that they will need through the informational pamphlet and the educational opportunities.

The information and educational needs of children's caretakers can be met in two ways:

- Implement a professionally-designed promotion campaign for the "big three" components of diarrhea care. It should include a well-designed poster, authorized by the Ministry of Health and the Pediatric Association, illustrating the three components of care that should be on the wall of every consulting room in Indonesia. It can be a teaching aid for the health worker, and it can also be referred to as the authoritative policy of the Ministry of Health and the country's leading pediatricians.
- A renewal of the ORT corners that were so successful in teaching caretakers how to give ORS will also be the best place to teach the child's caretaker how to

disperse and administer the zinc tablets to the sick child. The extra time with the caretaker provides an opportunity to reinforce the messages about ORS and continued feeding, and try to address any feeding problems that the child may have.

9.2 Coordination and Timing

Zinc products should be ready for the market by the end of 2007 or early in 2008, provided both registration of products and manufacturing continue as expected. The activities of this implementation strategy are as follows, in order of priority:

- E. Create a partnership with the drug companies that register zinc products. This is urgent since approval of packaging and instructional materials is part of the registration process and zinc products cannot be marketed until registration is complete. This is the opportunity for the Ministry of Health and the Pediatric Association to work with *Badan POM* and the drug companies in developing a common set of messages for promotion of zinc therapy and the three components of diarrhea care. Individual companies will then integrate this core message in their respective zinc marketing plan.
- F. Prepare an informational pamphlet on the scientific evidence for diarrhea case management. Work on this should start very soon for two reasons: first, because achieving a quick consensus on its content and presentation should not be assumed, and second, because it should be a useful compilation of evidence to help in the promotion of zinc in the rational treatment of diarrhea. This generic informational pamphlet will help develop individual promotional support material by the different zinc producers and help as a generic information to all health workers at the time that zinc products come onto the market.
- G. Prepare and plan the public campaign on the management of diarrhea for implementation after the zinc products are on the market and at the beginning of the diarrhea season. Distribution of the posters demonstrating the three components of diarrhea management should be done in such a way that they available to be put up in health facility consultation rooms and *Posyandu* meeting places at the same time as radio and TV spots are drawing people's attention to the availability of the new treatment for diarrhea. This should also coincide with the appearance of promotional activities by the drug companies.
- H. Plan educational activities for general practitioners in a phased fashion. First, they need to target general practitioners in public health facilities and in private practice. Several approaches should be explored to meet the needs of different groups depending on urban/rural location, public or private practice, and so on. Inputs should include different teaching-learning materials that can be used by groups or individuals. Seminars and courses should be designed to provide an atmosphere that helps to develop an educated consensus about good practice and deals honestly with the questions and objections that many participants will have.

- I. Facilitators for these educational activities can be found at the teaching staff of medical schools, pediatricians at provincial and district hospitals, pediatricians in private hospitals, trained IMCI facilitators, and so on. The activities should commence in early 2008 when the products, the informational pamphlet, and the posters become available. If possible, the training should be promoted through a supervised phased process to complete it as soon as possible,
- J. Plan educational activities for midwives and nurses for the second half of 2008. The Midwives Association has a ready process for training its members through the monthly association meetings that involve all its members and the group facilitators that are actively involved in in-service training already. The association has expressed interest in participating in the preparation of the teaching-learning materials for its members. These materials will probably be more suitable for the training of nurses than those for the general practitioners, and can be used in a similar way in a program to be organized by the district health offices.

These coordinated efforts between the Ministry of Health, professional societies, and private drug companies will ensure the widespread introduction of zinc as an effective therapy for diarrhea. Zinc therapy should be accepted by the medical community and by the public for sustained impact on diarrhea case management in Indonesia.

Appendix 1

Scope of Work

Indonesia Diarrhea Case Management Assessment

BACKGROUND

Despite the introduction of IMCI, and decades of efforts to increase the use of ORS to reduce dehydration and mortality from U5 childhood diarrhea, a review of the 2002/03 DHS results reveals that less than half of children with diarrhea (48.4%) receive ORS (packets or home-based salt-sugar solutions); less than a third of children (28%) receive proper ORT, particularly increased fluids; and about 14 percent of children with diarrhea receive no care at all. This is in spite of the fact that over 90% of mothers claim to be familiar with ORS. The care of children with diarrhea has in fact deteriorated in recent years. In 1997 (DHS), 48% of children with diarrhea were treated with ORS packets, but in 2002/3 only 36% were treated with ORS packets. In 1997, 57% of children were given increased fluids, while in 2002/3, only 28% were given increased fluids. Diarrhea prevalence in under five children appears to have changed very little in recent years. Prevalences in the two weeks preceding DHS surveys were 9% in 1994, 12% in 1997 and 11% in 2002/3. Diarrhea continues to be a major cause of death in children under five. Hence, there is urgent need to strengthen diarrhea case management in Indonesia

Furthermore, over the last several years, important advances have been made in diarrhea case management, in particular, the introduction of low osmolarity ORS and the treatment of diarrhea with zinc. Results from clinical and community trials have demonstrated that the provision of zinc during episodes of acute, watery diarrhea in children under 5 years old, shortens the duration of the disease, reduces its severity, and has a preventive effect on subsequent episodes during the 2-3 months following treatment. In May 2004, WHO and UNICEF issued a Joint Statement recommending a 10-14 day course of Zinc for Treatment of Diarrhea, in conjunction with oral rehydration solution or oral rehydration therapy (ORS/ORT). The recommended dosage is 20 mg/day for children 6 months to 5 years of age, and 10 mg/day for children 2-6 months of age. Studies in infants younger than 2 months old are currently underway.

An Indonesia Zinc Introduction Workshop, organized by the Global Zinc task Force was held in Jakarta from September 26-27, 2007. In follow-up discussions with the Director General of Public Health, it was agreed that a National Zinc Task Force should be formed under the leadership of the MoH in order to introduce zinc into the management of diarrhea in Indonesia.

Based on these findings and the new research, USAID recognized the utility of supporting an assessment of current practices regarding diarrhea treatment (within the home, community and facilities) in order to strengthen case management and revitalize ORT, as well as a "readiness" assessment to identify optimal strategies and next steps to

introduce zinc and low osm ORS in Indonesia, as state-of-the-art improvements in case management of U5 diarrhea.

OBJECTIVES

Overarching Objective: to decrease morbidity and mortality from diarrhea in children under 5 through strengthening child health and diarrheal disease programs in Indonesia.

6. Strengthen the capacity of the Indonesian MOH and its key implementing partners to reinvigorate diarrhea disease programming, with emphasis on strengthening case management, as well as introducing zinc in the treatment of diarrhea.
7. Assist the MOH and its key implementing partners to develop strategies, plans and a timeline for introducing improvements to revitalize ORT and introduce zinc in the treatment of childhood diarrhea
8. Assist the MOH to address particular implementation challenges associated with decentralization that are facing the Diarrheal Disease Program and Child Health Programs

OVERVIEW OF THE ASSESSMENT

The assessment will be divided into 4 phases (detailed below):

- Preparatory Phase prior to the Country Visit (1-2 months: Nov-Jan, 2006);
- In-country Data Collection and Assessment Implementation (3-4 weeks: Feb, 2007);
- Post-Assessment Stakeholder Presentations and Planning (end Feb, 2007);
- Post- Assessment Support (March+, 2007)

Assessment Team

External members

Case management	Jon Rohde	BASICS
Behavior change	Joan Schubert	BASICS
Logistics/Drug management	Jude Nwokike	RPM Plus
Private sector	Camille Saade	POUZN
Community & health systems	Iain Aitken (team leader)	BASICS

Internal members

Dr. Yati Soenarto	IDAI, Diarrhea Task Force.
Dr. Eva	CDC/Diarrhea, MOH
Dr. Neli	CDC/Diarrhea, MOH
	Nutrition Directorate, MOH
	Yanfar (Drug management) MOH

METHODOLOGY AND TIMELINE

Tasks prior to Country Visit

Literature review

The Desk Review will assemble and collate information that is available from published and unpublished literature and surveys on diarrhea and its management in Indonesia. Its purpose is to inform the assessment team and guide it in the planning and implementation of the In-country data-collection and assessment.

First week in Jakarta

Stakeholder meetings:

These are designed to introduce the Assessment and the team members to the key stakeholders in order to inform them of the planned activities and their purpose, and to gain their insights and advice on the current situation of diarrhea management, and the opportunities and problems associated with the proposed re-emphasis on improved case management and the introduction of zinc and low osmolarity ORS.

Stakeholder and Key Informant interviews

Also during the first week, the technical sub-groups of the team will want to interview key stakeholders and informants to collect detailed information relevant to their scopes of work.

Task Force and Assessment Team meetings

Regular meetings of the Assessment team with and without the Task Force will ensure sharing and validating of information, evaluation of progress and confirmation of ongoing plans.

Fieldwork (Second week +)

During this time, the team will divide into four sub-teams to visit separate regions of the country. They will use the Assessment Tool prepared beforehand to collect information through:

- Key Informant interviews
- Provider interviews
- Focused discussion groups
- Direct observations
- Facility surveys, inventories

The purpose of these interviews and discussions is not to collect a lot of primary data, but rather to reach a better understanding of data that is available and of the resources, approaches, barriers and opportunities for a program to improve diarrhea case management and introduce zinc therapy.

Sampling frame for the fieldwork:

Provinces/districts - selection criteria:

- Districts supported by USAID or major partners

- Contrasts in epidemiology of diarrhea and the quality of health programs
- Logistically uncomplicated for a short program.

Within districts, attention should be given to:

- Service delivery and its quality: public-private, urban-rural, hospital through village levels
- Logistics: pharmaceutical procurement, supply and distribution, management, and drug and non-drug outlets.
- Behavior change: roles of NGOs, community participation, volunteers, role of IEC/BCC media.
- The organization and management of child health services.

Third Week: In-country Briefing and Action Planning

Team meetings:

- Field work data needs to be collated, understood and put into a presentable format.

Separate meetings with the Task Force and key stakeholders for:

- Validation of findings
- Discussion of their significance
- Formulation of possible intervention strategies and programs.

Joint Stakeholder Meeting(s) (USAID, MOH, or key partners WHO, UNICEF, etc)

- Presentation of key findings from Assessment
 - Discuss and seek consensus on priority issues
- Planning Sessions: develop detailed recommendations for revitalizing ORT and introducing zinc with regard to:
 - Strategies
 - Plan
 - Milestones/Timeline
 - Indicators

Post-visit support

- Produce final report, including comprehensive assessment instrument/materials and recommendations.
- Develop more detailed implementation plan based upon initial strategies, plan and timelines drafted in stakeholder sessions post assessment

SUMMARY SCOPE OF WORK FOR TEAM

1. Strengthen capacity of MOH and its designated partners (e.g., Zinc Task Force) for zinc introduction and ORT revitalization by including them as an

- integral part of the assessment process. Identify additional members as deemed necessary to address ORT, not only zinc
2. Collect information on key diarrhea prevention and treatment issues.
 - a. Household beliefs, practices and care-seeking patterns by urban and rural residence and by wealth quintile.
 - b. Access, quality and utilization of health care services (including ORS) from public health facilities, private providers, and commercial/social marketing channels, by urban/rural residence, wealth quintile and province.
 - c. Review MOH policies, strategies, plans and programs (including IMCI).
 3. Review MOH policies and administrative procedures related to the treatment of diarrhea and the introduction of zinc as treatment for diarrhea.
 - a. Policy and legal framework: Registration, inclusion in the Essential Drug List (as a drug vs. nutritional supplement), approval as a public health commodity, etc.
 - b. Standards: National formulary, IMCI guidelines, standard treatment guidelines, etc.
 - c. Restrictions: Sale or distribution of ORS and zinc by community health workers, pharmacists, etc.
 4. Review current and potential product availability in country.
 - a. ORS and zinc products currently on the market and their sources.
 - b. Existing or potential in-country ORS and zinc manufacturers.
 5. Review and collect new information regarding policies, procedures, constraints and opportunities for improvement related to key health systems issues as they pertain to the prevention and treatment of diarrhea.
 - a. Pharmaceutical management: Financing, procurement, distribution, inventory management, use.
 - b. IEC/BCC: Mass communications, community mobilization/education, counseling.
 - c. Human resources: Training (pre-service, in-service), supervision, quality improvement.
 - d. Health information systems.
 - e. Private sector: For-profit, subsidized social marketing, non-profit.
 6. Review existing studies and assess need for further formative and/or operations research, including testing of existing draft guidelines (e.g., Diarrhea Treatment Guidelines, Community Health Worker Guidelines, Program Manager Guidelines).
 7. Review anticipated roles and responsibilities of various MOH units, donor partners, implementation partners, professional associations and other relevant stakeholders.
 8. Need to add more about new DATA/INFO COLLECTION especially case management practices in facilities (PHC and hospital), supplies and organization of work in this context'; treatment according to standards;

SEPARATED SCOPES OF WORK FOR DIFFERENT AREAS

Diarrhea case management

- **Oversee Desk Review**
- **Review information on key diarrhea prevention and treatment issues.**
 - Access to and utilization of health care services for children sick with diarrhea from public health facilities and private providers, by urban/rural residence, wealth quintile and province/district.
 - Quality of diarrhea management provided by health professionals in public and private facilities and the main determinants
 - MOH policies, strategies, plans and programs, standard treatment guidelines (including IMCI) for diarrhea management.
 - Review existing studies and evaluations of diarrhea management and IMCI, and assess need for further formative and/or operations research, including testing of existing draft guidelines (e.g., Diarrhea Treatment Guidelines, Program Manager Guidelines).
- **Review policies, procedures, constraints and opportunities for improvement of diarrhea management and the introduction of zinc therapy related to:**
 - Human resources: Training (pre-service, in-service), supervision, quality improvement.

Logistics and drug management

- **Review MOH policies and administrative procedures related to the treatment of diarrhea and the introduction of zinc as treatment for diarrhea and substitution of low osmolarity ORS as the approved formulation of ORS.**
 - Policy and legal framework:
 - Zinc: Registration, inclusion in the Essential Drug List (Zinc as a drug vs. nutritional supplement), approval as a public health commodity, etc.
 - Low osmolarity ORS: Procedures for changing the existing standards for the formulation of ORS
 - Standards: National formulary, IMCI guidelines, standard treatment guidelines, etc.
 - Restrictions: Sale or distribution of ORS and zinc by community health workers, pharmacists, etc.
- **Review policies, procedures, constraints and opportunities for improvement related to Pharmaceutical management:**
 - Financing, procurement, distribution, information systems, inventory management, use.

IEC / BCC

- **Review information on key diarrhea prevention and treatment issues:**
 - Household beliefs, practices and care-seeking patterns by urban and rural residence, education and by wealth quintile.
- **Review experiences of different NGOs and community-based organizations to identify best practices in accomplishing behavior change.**

- Review policies, procedures, constraints and opportunities for improvement of diarrhea prevention and treatment related to:
 - IEC/BCC: Mass communications, community mobilization/education, counseling and behavioral change.

Private Sector.

- Build on his work begun in September to assess the feasibility of and promote public-private partnerships for improved management of diarrhea.
- Review current and potential product availability in country.
 - ORS and zinc products currently on the market and their sources.
 - Existing or potential in-country low osmolarity ORS and zinc manufacturers.
- Review actual and potential commercial and social marketing channels.
- Review potential mechanisms for assessing and assuring quality of care in commercial and social marketing outlets.

Community health workers and health systems

- Community Health Workers (CHWs)
 - Review information on key diarrhea prevention and treatment issues.
 - Access, quality and utilization of health care services (including ORS) from community health workers
 - MOH policies, strategies, plans and programs involving CHWs, including sale or distribution of ORS and zinc by community health workers.
 - Identify agencies promoting and implementing community-based programs.
 - Review existing studies of CHW management of diarrhea, and assess need for further formative and/or operations research, including testing of existing draft guidelines (e.g., Community Health Worker Guidelines, Program Manager Guidelines)
- Health systems
 - Review organizational structure and roles and responsibilities of various MOH units, central and decentralized administrations, and NGOs in the provision of health services for the prevention and management of diarrhea.
 - For the introduction of zinc as part of an improved case-management of diarrhea, review anticipated roles and responsibilities of various MOH units, central and decentralized administrations, donor partners, implementation partners, professional associations and other relevant stakeholders.

Appendix 2 Tentative Itinerary Zinc Assessment Team

February 5 – 28, 2007

General Schedule: Feb 5 – 13 : Jakarta
Feb 14 – 21 : Field Visit
Feb 22 – 28 : Jakarta

DATE	TIME	ACTIVITY	LOCATION	PARTICIPANT	STATUS
Feb 5 Mon	5.20pm	Arrival of Katherine Farnsworth	Hotel Atlit Century	KF	✓
Feb 6 Tues.	13:30	Arrival of Zinc Assessment Team (external). Arrival times: JR 09.30; JS 12.00noon; JN 13.25; IA 17.35; CS 22.00. KF to go to HSP for logistics orientation from HSP CDC, USAID and HSP to meet to discuss planning for ZAT visit	To Hotel Atlit Century HSP CDC	External ZAT KF CDC, USAID, HSP, YS, RD	✓ ✓
Feb 7 Wed	08.30 – 09.30 09.30 – 11.00 11.00 – 12.00 13.00 – 17.00	Meeting with Pak Nyoman, Dr. Wayan and CDC Staff. ZAT members introduced to Pak Nyoman and each other Zinc Assessment Team (external) meeting. GA & SB meet external team. Meeting between Dr. Rosmini, Dr. Wayan with ZAT. Internal and External Zinc Assessment Teams meet to plan	CDC Office “ “	CDC, External ZAT GA and SB External ZAT, GA & SB Internal and External ZAT	✓ ✓ ✓ ✓
Feb 8 Thurs	08.00 – 10.00 10.00 – 12.00 13.00 – 17.00	Meeting with Dr. Anhari (HSP) re: decentralization Meet with WHO, UNICEF & HSP (Implementing partners) Zinc Assessment Team (Internal & external) Planning meeting	HSP HSP HSP	Internal and External ZAT „	✓ ✓ ✓
Feb 9 Fri.	09.00 – 12.00 13:00 – 17:00	<u>Indonesia Zinc Task Force Meeting</u> : Include Steering, Implementation and Technical Teams plus stakeholder representatives. GOI/MOH: Maternal and Child Health, Diarrhea Sub-Directorate (CDC), Nutrition, IMCI, Child Survival, Community Health/Posyandu, Health Promotion, Health Information Systems, Hospitals (Public and Private), District Health Office; Professional organizations (IDAI, IBI, Hospital Association, Pharmaceutical Industry/Regulatory Authorities (Kimia Farma, Indofarma, BPOM, Yanfar); : NGOs, Donors. Meetings between key stakeholders and individual ZAT members depending on area of interest.	CDC TBD based on stakeholder	Internal and External ZAT Individuals on ZAT	✓ ✓
Feb 10 Sat.	09.00 – 12.00 13.00 – 17.00	Meetings with key stakeholders (continued) Internal and External ZAT meeting: Review Indonesia ZTF meeting, continued planning.	TBD	Internal and External ZAT	✓

Feb 11 Sun	Free Day				
Feb 12 Mon	08.00 – 09.00 10.00 - 17.00	External ZAT meeting with Lynn Adrian & USAID BHS Health Meetings with key informants	HSP Offices – Ratu Plaza TBD	External ZAT Internal and External ZAT	✓ ✓
Feb 13 Tues	08.00 – 17.00	ZAT travels together to Tangerang, Banten Province for field visit. ZAT divides into two or more groups to cover meetings with key stakeholders.	Tangerang, Banten Province	Internal and External ZAT	✓
Feb 14 - 21		FIELD VISIT: out of Jakarta	TBD	Three Groups	KF
Feb 22 Thurs	9:00-12.00 13.00 – 17.00	Team meetings to collate fieldwork findings Meetings with key stakeholders	HSP office	External ZAT	
Feb 23 Fri	9:00-11:00 10.00-12.00 14.00 – 17.00	Bidan Team meetings to collate fieldwork findings Yanfar and BPOM	DepKes CDC MOH/Yanfar	JS IA, JN, YF Internal/External ZAT	Dr. Wayan
Feb 24 Sat	09.00 – 17.00	Wrapping up information gathering & Write up findings		Internal and External ZAT	
Feb 25 Sun	Free Day				
Feb 26 Mon	08.00 – 09.00 10.00-11.00	Meeting with Pak Nyoman Meeting with Dr. Rosmini Meetings with key informants and stakeholders		Internal and External ZAT	
Feb 27 Tues	08.00 – 13.00 11.00-12.00 14.00 – 16.00	Write up findings Meeting w. Dr Hanni Roespandi, WHO Debrief: HSP - USAID	Hotel Atlet Century/ HSP office	RG, JM, LA, GA, SB	
Feb 28 Wed	10.00 – 12.30	<u>Indonesian ZTF Meeting:</u>	MOH-CDC	All participants & Internal/External ZAT	Dr. Wayan
	evening	Leave Jakarta		CS, IA, JS	
Mar 1 Thurs		Leave Jakarta		KF, JR, JN	

External ZAT:

Iain Aitken (IA)
Jon Rohde (JR)
Joan Schubert (JS)
Camille Saade (CS)
Jude Nwokike (JN)
Reggie Gipson (RG)
John McComb (JM)
Askar (AS)

Internal ZAT:

Yati Soenarko (YS)
Eva (ES)
Neli (NS)
Ria and Ir (GZ)
Yanfar (YF)
Lynn Adrian (LA)
Greg Adams (GA)
Sri D. Boediardjo (SB)

BASICS: Katherine Farnsworth (KF)

MOH: Wayan Widaya (WW)
Rosmini Day (RD)

HSP:

ZAT=Zinc Assessment Team
ZTF=Indonesian Zinc Task Force

Field Visit:

Banten visit: To be covered by External and Internal ZAT members during stay in Jakarta.

Team I: North Sumatra: Cap: Medan Districts: Tapanuli Tengah; Tapanuli Selatan; Deli Serdang

Team II: Yogyakarta-Central Java Cap: Yogyakarta-Semarang District: Bantul; Gn Kidul; Prambanan-Klaten; Purworejo

Team III: East Java- NTB Cap: Surabaya-Mataram District: Surabaya; Kediri District; Lombok Tengah

BANTEN visit: TBD		Note	
Feb 14	am pm	Meeting PHO & team Jakarta Local private hospital, private clinic	
Feb 15	am pm	DHO Central Jakarta visit & puskesmas Leave for Banten & PHO visit (Serang)	2 hr drive
Feb 16	am pm	DHO team and key stakeholders meeting Tangerang district Hospital, Private clinic & drug outlet visit	1 hr drive
Feb 17	am pm	Puskesmas & posyandu visit Polindes & private midwife visit	
Feb 18	am pm	PHO visit and key stakeholder meeting. Visit hospitals (public/private). Leave for Bandung	3 ½ hrs drive
Feb 19	am pm	Laboratory, private clinic, drug outlets Wrap up at HSP Bandung office	2 ½ hrs drive
Feb 20	am pm	Leaving for Bogor: DHO visit and key stakeholder meeting Hospital, private clinic, drug outlet visit	3 hrs drive
Feb 21	am pm	Visit puskesmas, village midwife Visit private hospital	
Feb 22	am	Back to Jakarta	2 hrs drive

TEAM IA : Ika Iryanti, Jude Nwokike		Note	TEAM IB : Joan Schubert, Ria Sukarno, Yullita Evarini		Note
Feb 14	am pm	Arrival Medan Meeting w PHO and key stakeholders			2 hrs flight Tiara Medan Hotel HSP to pick up at the airport, then arrange rental car on site
Feb 15	am pm	Leave for Tapanuli Tengah Meeting w DHO and key stakeholders	40 minute flight Wisata Indah, Mrs. Eka (HSP) to arrange for a car	Feb 15	am pm TBD
Feb 16	am pm	Visit puskesmas, posyandu, village midwife Visit private clinic, Bidan Delima		Feb 16	am pm TBD - Visit puskesmas, posyandu, village midwife Visit private clinic, Bidan Delima
Feb 17	am pm	Visit Hospital & leave for Tapanuli Selatan Meeting DHO and key stakeholders	2 hrs drive	Feb 17	am pm TBD - Visit Hospital Meeting DHO and key stakeholders
Feb 18	am pm	Pending flight availability Visit hospital, puskesmas, Bidan Delima midwife Village midwife, private clinic, drug outlet	2 hrs drive, 40 minute flight, 1 hr drive - return flight to be arranged on-site Tiara Medan Hotel	Feb 18	am pm Leave for Banda Aceh
Feb 19	am pm	Pending flight availability Leave for Deli Serdang Meeting with DHO and key stakeholders	2 hrs drive, 40 minute flight, 1 hr drive - return flight to be arranged on-site Tiara Medan Hotel	Feb 19	am pm TBD (HKI)
Feb 20	am pm	Visit puskesmas, posyandu, hospital Visit private clinic, Bidan Delima, village midwife		Feb 20	am pm TBD (HKI)
Feb 21	am pm	Back to Medan and hospitals visit (public & private) Wrap up at HSP Medan office Back to Jakarta	1 hr drive 2 hrs flight	Feb 21	am pm TBD (HKI) Back to Jakarta

TEAM II : Jon Rohde		Note	TEAM III: Iain Aitken, Dr. Wayan Widaya, Ir. Sunarko, Sri Durjati Boedihardjo, Camille Saade (Lombok)		Note		
Feb 14	am pm	Arrival Yogyakarta PHO visit and key stakeholder meeting	1 hr flight	Feb 14	am pm	Arrival Surabaya PHO visit and key stakeholder meeting DHO visit and stakeholder meeting	1 ½ hrs flight Singgasana Hotel Anam rental car
Feb 15	am pm	Bantul: DHO visit and stakeholder meeting, puskesmas, Bidan Delima, hospital visit	½ hr drive	Feb 15	am pm	Public hospital, University Airlangga Puskesmas, posyandu, Bidan Delima Private clinic, Drive to Kediri	3 ½ hrs drive Hotel, Kediri
Feb 16	am pm	Bantul: Hospital visit (public and private) Yogyakarta: private clinic, drug outlets	½ hr drive	Feb 16	am pm	Kedire DHO and General Hospital Puskesmas, VMW Kedire District Hospital Drive back to Surabaya	Singgasana Hotel 3 ½ hrs drive
Feb 17	am pm	Gn Kidul: DHO visit and key stakeholders meeting Puskesmas, posyandu cadre, village midwife	1 ½ hr drive	Feb 17	am pm	Fly to Bali Pustu MW, Bidan Delima,	Hotel, Kuta
Feb 18	am pm	Semarang: PHO visit and key stakeholder meeting Purworejo: DHO visit and key stakeholder meeting	3 hrs drive 3 hrs drive	Feb 18	am pm	Flight to Mataram	2 hr flight
Feb 19	am pm	Purworejo: Hospital, Bidan Delima, private clinic Return to Yogyakarta	3 hrs drive	Feb 19	am pm	Mataram: PHO visit and key stakeholder meeting (Praja) Bidan Delima	
Feb 20	am pm	Prambanan/Klaten: puskesmas, posyandu, village midwife Prambanan: Hospital, private clinic, drug outlets	½ hrs drive	Feb 20	am pm	Lombok Tengah: DHO visit and key stakeholder meeting Hospital, Puskesmas, private midwife	1 hr drive
Feb 21	am pm	Yogyakarta: Hospital public & private, Yogyakarta: University UGM, Laboratory Back to Jakarta	1 hr flight	Feb 21	am pm	Puskesmas, posyandu, drug outlet Wrap up at hotel Back to Jakarta	1 ½ hr flight

Appendix 3

People Met and Consulted

JAKARTA

Health and Nutrition, USAID Mission

Ms. Lynn Adrian
Mr. Greg Adams
Ibu Sri Boerdiharjo

Ministry of Health

Dr. I. Nyoman Kandun	Director General, Disease Control
Dr. Rosminy Day	Director, Communicable Disease Control
Dr. Wayan	Head, Diarrhea Division

Dr. Bahron Arifin	Director, Public Drug Supply Management
Dr. Bahdar Johan	Director, Drug Production and Distribution
Dr. Nani Sukasediati	Director, Rational Use of Medicines

National Agency of Drug and Food Control (Badan POM)

Dr. Husniah Rubiana Th. Akib	Director
Dr. Atie Soekandar	Deputy Director
Dr Atick Sukander	Dir., Drug and Biological Product Evaluation.
Dra A. Retno Tyas Utami	Copy Drug and Biological Product Evaluation.
Dra Reri Indriani	Head of Drug Information Unit.

Dr Sri Suryawati	Director, Center for Clinical Pharmacology and Medicine Policy Studies, UGM
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Dr H. Syahrizal Syarif	Pengurus Besar Nahdlatul Ulama
Sr. M. Margaretha	Persatuan Karya Dharma Keshatan Indon.
Drs Yos Hudyono	Manggala Jiwa Mukti Indonesia

USAID Health Services Project, JSI.

Dr. Reg Gipson	Chief of Party
Ms. Laurel MacLaren	Deputy CoP/Management Implementation
Mr. John McComb	Senior Technical Manager
Dr. Anhari Achadi	Deputy CoP/Program Implementation
Dr. Wihardi Triman	Quality Assurance
Ms. Randa Wilkinson-Bouvier	Nutrition
Dr. Budi Utomo	Monitoring and Evaluation Adviser

Dr. Hanny Roespandi	National Professional Officer, WHO
Dr. David Hipgrave and staff	UNICEF
Ms. Fitsum Assefa	UNICEF
Ms. Anna Winoto	UNICEF
Mr. John Palmer	Helen Keller International
Ms. Elviyanti Martini	Helen Keller International

Dr. Sukman	President IDAI and Vice President IDI
Dr. Agus Firmansyah	President – BKGAI
Prof. Sudigdo Sastroasmoro	Chair, Medical Standards Commission for Yanmed

Pharmaceutical Industry

Dr. Sujitno Fadli

Yulia Amalani

Drg. Shita Paramayanti

Deene Andreani

Parulian Simanjuntak

P. Sudibyo

H. Muhammad Munawaroh

Roy Lembong

Soedibyo

Sofiarman Tarmizi

Dr. Paul Harianto

Evi K. Santoso

M. Hasan E. Karna

Dr. Sandra Fadli

Dr. D. T. Subowo

Dr. Raymond R. Tjandrawinata

Seelam (Sam) Devanand

Medical Support Manager, Kalbe Farma

Registration Manager, Kalbe Farma

Business Development Manager, Kalbe Farma

Business Development Officer, Kalbe Farma

Executive Director, International Pharmaceutical
Manufacturers Group

Finance Director, Indofarma

Marketing Director, Indofarma,

Director, Novell Pharmaceutical Laboratories

Marketing Manager, Kimia Farma

Marketing Director, Kimia Farma

Managing Director Pharmaceuticals, The Tempo
Group

Deputy General Manager – Ethical & Hospital, The
Tempo Group

General Manager, Interbat

Business Development Manager, Interbat

Managing Director, Combiphar

Director of Scientific Affairs and Corporate
Development, DexaMedica

General Manger – Exports & Business
Development, SANBE

WEST JAVA PROVINCE

Tangerang District

Dr. Shirley Ivonne

Dr. T. Widarsini

Dr. Ana and staff

Staff

Dr. Mes and staff

Deputy District Health Officer

Head, Sub-province Pharmacy Warehouse

Siloam Private Hospital

District Hospital

Puskesmas Balaraja

SURABAYA PROVINCE

Surabaya Provincial Health Office

Dr. Lilik Endahwati

Ibu Nurul

Mr. Adar

Dr. Valerina

Dr. Dian Islami

Ibu Sri Wayuningsih

Ibu Suwarti

Ibu Luki

Ibu Piasningsih

Deputy Director

Diarrhea Section

Previous head of Diarrhea Section

Basic Health Services

Child Health/MTBS (IMCI)

Nutrition

Pharmaceutical services

Nutrition Academy

Midwives Association

Medical Faculty of Airlangga University, Dr. Soetomo General Hospital

Prof. Subijanto Marto Sudarma

Head, Pediatric Gastroenterology, and President,
Gastro-hepatology Section of The Indonesian
Pediatric Association (IDAI)

Prof. Bambang Permono.
Dr. Boerhan Hidayat.
Dr. Alfa Fardah

Head, Child Health Department
Head, Pediatric Nutrition and Metabolic Diseases.
Pediatrician.

Surabaya City Health Office

Ibu Lis Marsulis
Ibu Mutmainah
Ibu Endang Sri Resmiati

Family Health
Diarrhea
Midwives Association.

Puskesmas Geding

Dr. Hunainah Director
Ibu Maria Magdalena
Ibu W.R. Rasban
Ibu Lis Pringgo
Ibu Siti Hindun

Midwife (& Midwife Delima)
Kader
Kader
Kader

Gotong Royong Private Polyclinic

Dr. Gladdi Woeworuntu

Clinical Director.

Surabaya Provincial Bidan Delima Facilitator Training Course

Ibu Roesmentahingsih
Ibu Munameh
Ibu Tyas Edi Winarsih
Ibu Syamsiar Syam
Ibu Naning Eko

Deputy Chair, Midwives Association, Surabaya.
Communications Trainer
Bidan Delima
Bidan Delima
Bidan Delima

Kedire City Health Office

Dr. Gatot Widiatoro
Dr. Nurul Kusumanwati
Ibu Erna Agustini
Mr. Sumedi

City Health Officer
Communicable Disease Control
Diarrhea section
Puskesmas and Hospitals

Kedire City Hospital

Dr. Samsul
Dr. Wasis

Deputy Director
Pediatrician

Puskesmas Ngletih

Dr. Rizal
Dr Andre
Mr. Kustarijo
Ibu Kasiati
Ibu Tati Rahmadiati

Doctor (and a district IMCI facilitator)
Doctor
Nurse in charge of in-patient care and diarrhea.
Nurse
Midwife.

Kedire District Health Office

Dr. Nurmunawaroh
Mr. Kharismun

Communicable Disease Control
Diarrhea section

Kedire District Hospital

Dr. Endang Harowatiningsih
Dr. Hermanto
Ibu Suginah

Director
Pediatrician

Dr. Nani	Emergency room doctor
Ibu Musyawaroh	Emergency room nurse
Ibu Ida Surarsih	Midwife, neonatal ward
Ibu Nani	Nurse, Child Health Outpatient Clinic
Ibu Sutarti	Chief of Nursing

Ibu Erna Hidayati	Bidan Desa, Tegowangi Village.
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Kediri City Hospital

Dr. Samsul Ashar	Dep. Dir. Services
Dr. Bambang Jatmiko	Pediatrician
Dr. Wasis Setiadi	Pediatrician
Ibu Yayuk	Head of Nursing.

BALI PROVINCE

Ibu Sri Wartani	Bidan Desa, Pustu, N.Kuta
Ibu Ni Putu Jati	Bidan Delima, Owner of Bidan Nipatudjati, Kuta

NTB PROVINCE

NTB Provincial Health Office

Dr. Slamet Tjahjono	Deputy PH Officer
Dr. Agus Joko Sumomo	Sub-directorate, Supplies
Dr. Ismail	Communicable Disease Control
Mr. Isbandono	Diarrhea Section
Ibu Luh Suwandeni	Nutrition
Ibu Rida Sudiarti	MCH
Ibu Rida Iswati	Health Promotion
Dr. Handayani	Puskesmas
Ibu Gita Suciati	Pharmacy

Central Lombok District Health Office

Dr. Wayan	District Health Officer
Dr. Eka Dewi	Communicable Disease Control
	MCH

Puskesmas, Praya

Director of Puskesmas and staff

District Hospital, Praya

Dr. Wayan	Director
-----------	----------

Puskesmas, Gunung Sari

Dr. Azrul	Director and Dentist
Dr. Oke Dharmawan	Medical Officer
Ibu Avian	Diarrhea
Ibu Sri Trisnawati	Midwife

NTB Provincial Hospital

Dr Sukardi Head of Pediatrics

YOGYAKARTA AND CENTRAL JAVA**Gadjah Mada University Faculty of Medicine**

Prof. Dr. Hardyanto Soebono Dean
Dr. Iwan Dwiprahasto Vice Dean I

Provincial Health Office – Daerah Istimewa Yogyakarta

Dr. Bondan Agus Suryanto Director
Elfi Efendi Surveillance Division
Yuwono Hadiwijoyo P2M Division
Dr. Arida Utari Health Service Division
Tuti Nutrition Division

Klaten Teaching Hospital

Professor Arief Faisal Director
Dr. Hermanu Pusponingrat Vice Director
Dr. Nov Sugianto Head of Pediatric Department
Dr. Priadi Rahardjanto Pediatrician
Dr. Samad Pediatrician
Dr. Musim Pediatric Resident
Dr. Yustina Pediatric Resident

Bantul – District Health Office and Hospital

Deputy Head of Kabupaten
Yuwono P2M
Jumali P2M
Dr. Endang Hospital Director
Dr. Raras Pediatrician

Bambanglipuro Puskesmas

Dr. Dwijo Head and Staff
Dr. Bagus Staff
Dr. Staff
Puji P2M

Dlingo Puskesmas

Dr. Bagus Head and Staff
Village midwife

Purworejo DHO

Dr. Ulfah Head and Staff

Purworejo Puskesmas

Dr. Nurhayanti Head and Staff of about 20
Ibu Rosidah Delima Midwife, Purworejo

Kabupaten Hospital – Purworejo

Dr. Gustanul Arifin	Director
Dr. Juliance	Vice Director
Dr. Yanti	Pediatrician

Community and Nutrition Research Field Site – Purworejo

Sukarman (CHN) and staff

Private Clinic Purworejo

Dr. Sri Wuryanto Warijan

Prambanan Puskesmas (Puskesmas Kebondalem Lor & Puskesmas Prambanan)

Dr. Rini Indrastuti	Head of Puskesmas Kebondalem Lor
Dentist, Kebondalem Lor	
Midwife, Kebondalem Lor	
Dr. Ahmad Budoli	Head of Puskesmas Prambanan
Nutritionist, Prambanan	

Gunung Kidul DHO

Bambang Priyanto	P2MPL
Bakti Pratiwi	Program development
Purwohadi	Promotion
Aris Suryanto	Nutritionist
Drg Isti Indiyani	Dentist / Public Service
Surono	P2MPL
Kartini	Program development
Heri	P2MPL

Nglipar II Puskesmas (Gunung Kidul)

Susilo	Head
Staff (general practitioner)	
Staff (dentist)	
Delima Midwife	

Assessment Support Team

Dr. M Juffrie, Sp.AK, Ph.D
Dr. Diarum Puspasari
Dr. Lucia Nauli Simolon
Dr. Tri Budi Hartomo

NORTH SUMATERA PROVINCE**North Sumatera Provincial Health Office**

Dra Fatni Sulani	PHO
Dr. Surya Dharmas	Head, CDC
Dr. Wiltar Nainggolan	Head, Health Promotion
Dr. Siskandri	Head, Pharmacy
Heldinar Simbolon	Province Pharmacy Warehouse
Dr. Jamidin Manurung	Daily Executor, Balai Besar POM, Medan

Serdang Bedagai District Health Office

Dr. Zulkifli Head, CDC
Pak Dasril
Dra. Andi Hijenad Head of District Pharmacy Warehouse

Puskesmas Sei Rampah

Dr. Jon Simajuntak Director

Kota Medan District Health Office

Ibu Rumona Head, CDC
Pak Rusmanto District Warehouse

Puskesmas Petisah

Zuraidah Pane & Leilan Azizah Drug Officers

Adam Malik Central Hospital

Dr. M. Nur Rasyid
Ibu Mashri Head Nurse, Pediatric Ward
Dra. Ellia Puspa Head of Depo Pharmacy RINDU B Di

ACEH**Provincial Health Office**

Dr. Media Head, CDC

District Health Office, Aceh Besar

Mardiah Head, CDC
Zulkarnain Head, Health Promotion
Rusdi Head, Nutrition

Puskesmas Darussalam

12 Bidan Desas

Posyandu Bunga Juempa

Kader and seven mothers

Puskesmas Ingin Jaga

Staff and kaders

Puskesmas Jantho

Dr. Tika Doctor in charge

Ibu Erika Bidan Desa

Helen Keller International

Monitoring and Evaluation team

Appendix 4
Zinc Task Force Meeting, February 9th, 2007
Attendance List

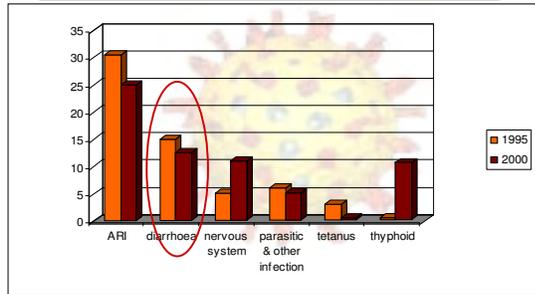
Participants

Present:	Organization
Dr. Nyoman Kandun	MOH
Joan Schubert	BCC Advisor/BASICS
Sudi Biya	KOEF
Hanny Rarspandi	WHO
Eko Sriwidyawati	Kimia Farma
Ening Budihartati	Kimia Farma
Camille Saade	AED/BASICS
M. Munawarah	Indofarma
Dom Suryamah	PP IBI
Dr. Muh Ilhamy	Dit Binkes Ibu Depkes
Jl. Rubik	MKLH PP Aryinah
Dr. Wayan Widaya	Subdit Diare
Dr. Yullita Evarini Y	Subdit Diare
Jr. Margaretha	Perdhali
Ria	DepKes
Awi Muliadi W.	Dit Binakes Anah
Hafni R.	Pasat Promkes
Jos. E. Hudyono	MJM/MSH
Dr. Wita Nursanthi	Dit. Bina Sanmed
Sunarko	Dit Gizi
Syahrizal	NU
Jude Nwokike	MSH/BASICS
Katherine Farnsworth	BASICS
Irawaty Maiuillang	Pelkesi
Narai	Subdit Diare
Naniek Marnati	Subdit Diare
Dr. Karneli Herlena	Subdit Diare
Nanik Sri Hariyani	Subdit Diare

Appendix 5
Diarrhea as a Major Problem in Pediatrics

Yati Soenarto
Department of Pediatrics
Gadjah Mada University/Sardjito Hospital
Yogyakarta, Indonesia

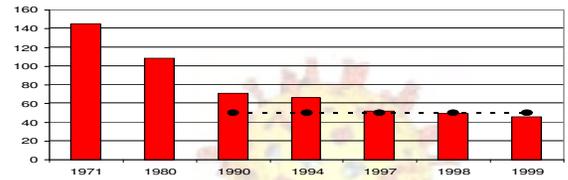
LEADING CAUSES OF DEATH IN CHILDREN U 5



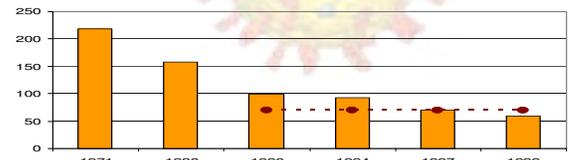
MOH, 2003

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Infant Mortality Rate in Indonesia

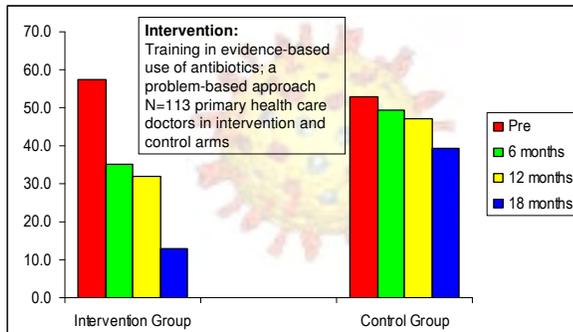


Under 5 Mortality Rate in Indonesia



Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Use of Antibiotics for Diarrhea at baseline, 6, 12 & 18 months after intervention



Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

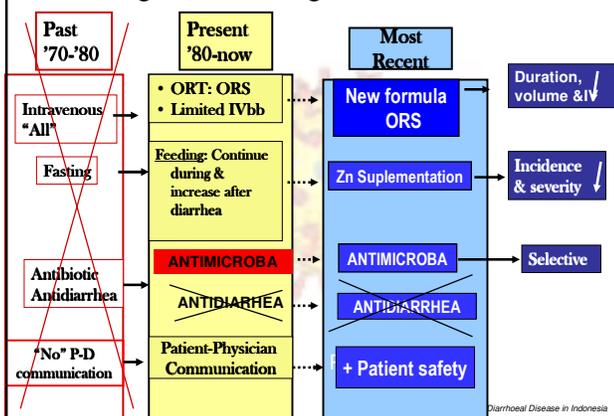
CASE MANAGEMENT OF DIARRHEA

1. Fluid and food management
2. Use of drugs
3. Communication:

Physicians - Patients - parents

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Progress: management of diarrhea



Diarrhoeal Disease in Indonesia

Problems on diarrhea case management

ORT:

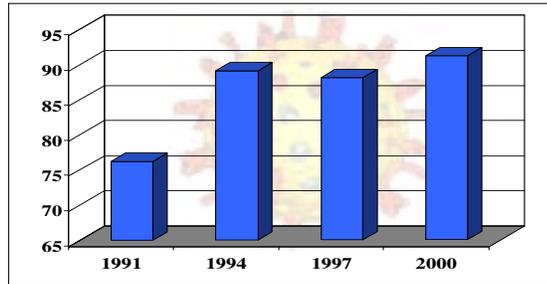
- ✦ ORS fails to reduce stool volume & duration
- ✦ Not always available / acceptable
- ✦ Not palatable
- ✦ Too costly
- ✦ Not fulfilling energy requirement

NUTRITION :

- ✦ Loss appetite
- ✦ Nutrient lost: vomit & stool losses
- ✦ Loss of intestinal saccharidases → malabsorption
- ✦ Withholding of food
- ✦ Catabolic effect of the infection

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

THE INCREASE OF ORT USE FOR DIARRHEA 1991 - 2000



SOURCE : Indonesian Demographic Health Survey (IDHS)

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

THE ROLE OF INDONESIAN PEDIATRIC GASTROENTEROLOGY PEER GROUP

DIARRHEA CASE MANAGEMENT

1.NGO:Coord.Board of Ped Gastr

- ❖ Community based program

2.Prof.Association

- ❖ Research development
- ❖ Curriculum innovation

3.Universities

- 1972 : with NGOs, Community and private sectors Support program (MOH) activities :

- 1975 : Rehydration Centre at Teaching Hospitals
Rehydration Corner at Health Centers
- 1997 : Working group of breast feeding promotion
- 1985 :Diarrhea Training Unit (DTU)at 7 Medical Schools
- 1986 : MEDIAC implementation to Medical Schools : 6 → 14 → 35 (all) Medical Schools → Nursing Program
- 1996 : MED-IMCI
- 2000 :

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

HOME MANAGEMENT OF DIARRHEA

	1994	1997	2000
Increased fluids:			
IDHS (2003)	56,5	57,0	96.7 *
Urban	90,5	61,7	-
Rural	53,5	56,5	-
Continued feeding:			
IDHS	52,0	49,6	-
Increased fluids and continued feeding:			
MCHS (2003)			31,9
Urban			27,3
Rural			36,0

MCHS : Mother & Child Health Survey

IDHS : Indonesian Demography & Health Survey

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Drugs given by HC personal in cases with bloody & watery stool (1991-1992)

Drugs given for 168 diarrhea attacks from 141 U5 children	Dysentery		Watery	
	N	%	n	%
Antibiotics & antidiarrhea	3	13.6	19	16.5
Antibiotics	19	86.4	84	78.0
Anti Diarrhea	0	0	3	2.6
No drugs	0	0	8	7.0

Studies on the etiology of Diarrhea

Causative agents	'78 - '79 % (n:338)	'90 - '92 % (n=131)	'04 - '05 % (n=638)
Enteropathogens	56	80	29
Rotavirus	38	66	Not yet analyzed
ETEC (LT&ST)	11.5	NE	NE (not examined)
Salmonella	6	2.1*	6
Shigella	4	1.8*	1
Cryptosporidium		1.3**	NE
E. Histolytic	0.3	0	NE
Mix enteropathogens	7.6	3	NE

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

2005 : Sardjito teaching hospital: ISO 2000

2006 : Study on "Patient safety study on diarrheal disease management".

Preliminary result (n 121):

• IV Fluids

- No dehydration: 12.3%;Vomit: 83.2%
- Some dehydration: 12.7%;Vomit: 93%
- Severe dehydration: 100%

Guidelines: IV Fluid only for severe dehydration & Profuse Vomit.

• Antibiotics

- Acute watery diarrhea:0.6% - Intolerance: 0%
- Persistent: 75%
- Dysentery: 90%
- Intolerance: 0%

Guidelines: Antibiotics only for dysentery & persistent diarrhea.

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

• 1 in 5 outpatient; 1 in 65 hospitalized;
 1 in 293 die due to RV;
 • 20%-8.5% of all children hospitalized for diarrhea;

- U.S: \$560 mill/yr, & \$ 200 mill loss of productivity
 - PERU: \$ 2.6 thsnds /yr
 - India: severe Diarrhea: \$2,663/prson

median 440,000 death in <5yrs

RV Worldwide

20% of all deaths in children <5 yrs in developing countries

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Mortality

Year	1972	1980	1986	1992	1996
Mortality	40	24.8	16	7.5	7.4

Morbidity

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Morbidity	0.8	1.0	0.8	0.8	0.8	0.8	0.8	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1

Economic crisis (1998-2000)

Cost: ?

Deaths: Diarrhea :2nd cause RV: ?

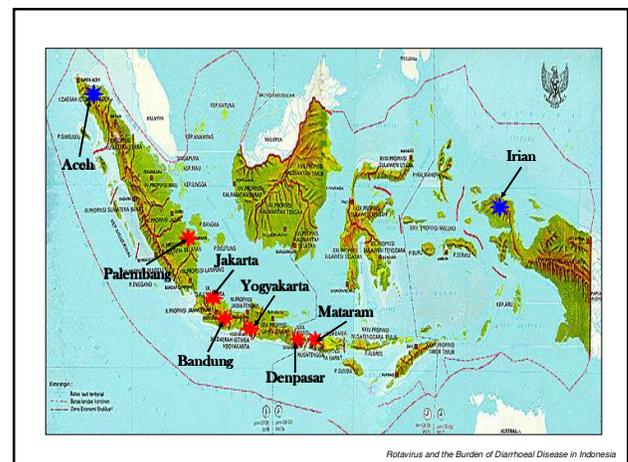
Longitudinal (1/> yr) hospital studies;RV diarrhea:
 '80 - '84: 21% - 42% (8 long.studies);
 '78 - '79: 38%; Strain: G1 - G4;
 '00 - '05: 53%; Strain: G1,3,4; G9

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

- ➡ **1973** : Rotavirus discovery (R. Bishop, RCH/UniMelb)
 - ➡ **1976** : Pilot study, in which RV was found in 12% of children with acute diarrhea in Jogjakarta,Indonesia(Lancet).GMU-RCH, Introduced by J.Rohde (Rockefeller F)
 - ➡ **1976** : Asymptomatic excretion of RV (RCH, Melbourne)
 - ➡ **1978** : A case control hospital & a cohort community design (GMU-RCH) → published:
 - ➡ **1979** : RV in Yogya, Indonesia - 38% of admissions - J Clin Microbiol
- Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

- ➡ **1983** : Neonatal infection shown to protect against community strains (RCH, Melbourne)
 - ➡ **1989** : Funding to prepare RV3 as an oral vaccine - Flow Labs, USA (RCH)
 - ➡ **1994** : Phase I trial started - funded by AMRAD (RCH)
 - ➡ **1997** : Phase II trial started - funded by AMRAD & Australian Government (RCH)
- Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

- ➡ **2001 - 04** : Hospital-based system & strain surveillance for rotavirus diarrhoea and estimate of disease burden in Indonesia. A Multi Country Study on Rotavirus Surveillance, Coordinated by CDC Atlanta. Funded by PATH (GMU)
 - ➡ **2002 - 04** : An Extending Surveillance to Estimate the Disease Burden of Rotavirus Gastroenteritis in Yogyakarta and Central Java Indonesia (GMU).
 - ➡ **2006 - 08** : Multicenter Study (6 teaching hospitals): Extension for Hospital Based Surveillance and Strain Characterization of Rotavirus Diarrhoea in Indonesia. Funded by PATH & Biofarma (GMU).
- Rotavirus and the Burden of Diarrhoeal Disease in Indonesia



Diarrhea Cases

- Diarrhea morbidity in Indonesia at 2005 : 1.343.276 (19 provinces)
- Diarrhea mortality in Indonesia at 2005 : 119 (14 provinces) (Subdit.Ditjen Diare P4D, 2005)
- Diarrhea morbidity in DIY at 2006 : 11.460 (without Gunung Kidul) (Dinkes DIY, 2006)
- The highest morbidity : NTB → 193.759
- The highest mortality : Sulsel → 49 (Subdit.Ditjen Diare P4D, 2005)

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Rational Management of Diarrhea

Antibiotic	Rational	Irrational	Anti-diarrhea	Rational	Irrational
Teaching Hospital	61,1%	38,9%	Teaching Hospital	99%	1%
Non-teaching hospital	0,2%	99,8%	Non-teaching hospital	99,8%	0,2%

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

- Antibiotic used in Primary health care services for acute diarrhea: 85% (Iwan Dwiprahasto,2006)
- Inappropriate intravenous rehydration in Sarjito : 66%
- Inappropriate intravenous rehydration in Klaten : 94% (Rasionalisasi Tatalaksana Diare Akut, Unpublished, 2007)

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Terima Kasih

Rotavirus and the Burden of Diarrhoeal Disease in Indonesia

Appendix 6
Evidence on Low Osmolarity ORS and Zinc Therapy

Diarrhoea Mortality

- 1980: 4.6 million child deaths from diarrhoea
- 2003: 1.8 million child deaths from diarrhoea

Black, Morris, Bryce. *Lancet* 2003.
Jones, Steketee, Black et al. *Lancet* 2003.

Major causes of death among children under 5 years of age and neonates in the world, 2000-2003

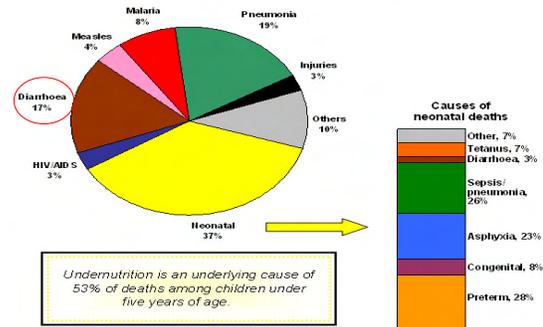
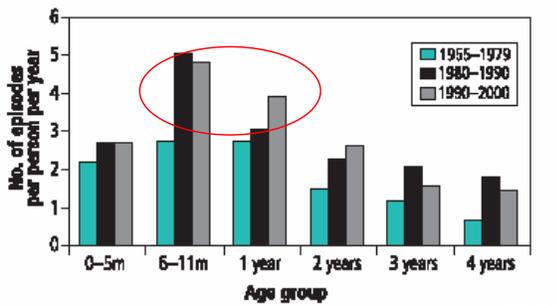
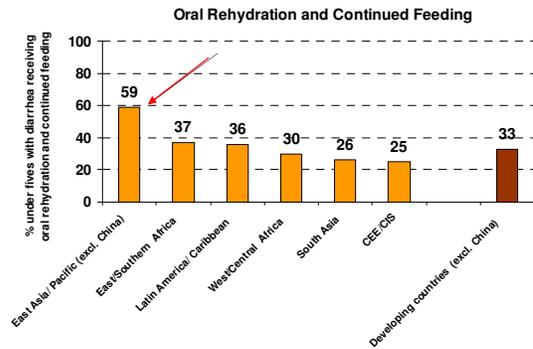


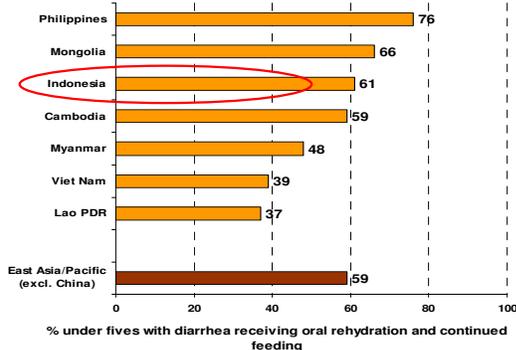
Fig. 1. Median age-specific incidences for diarrhoeal episodes per child per year from three reviews of prospective studies in developing areas, 1955-2000



Regional ORT & CF Coverage



ORT & CF Coverage (EAPRO)



Global Diarrhoea Treatment Policy

- Treatment of dehydration with ORS solution
- Continue feeding or increase breastfeeding during , and increase feeding after the diarrhoeal episode
- Use antibiotics only when appropriate (i.e. bloody diarrhoea)
- Abstain from administering anti-diarrhoeal drugs
- Advise mothers of the need to increase fluids and continue feeding during future episodes
- Provide children with 20mg per day of zinc for 10-14 days

WHO/UNICEF. *Joint statement on the clinical management of acute diarrhoea.* 2004.

WHO/UNICEF ORS - 1978

- NaCl 3.5 g
- NaHCO₃ 2.5 g
- KCl 1.5 g
- Glucose 20 g
- Na⁺ 90 mEq/l
- K⁺ 20 mEq/l
- HCO₃ 30 mEq/l
- Cl⁻ 80 mEq/l
- Glucose 111 mmol/l
- Osmolar. 331 mmol/l

ORS Formulas: 1984

Sodium mEq/l	Glucose mmol/l	Base mEq/l	Osmol mOsmol/l
90	111	30 (bicarb.)	331
90	111	10 (citrate)	311

Comparison of Bicarbonate and Citrate ORS in Cholera

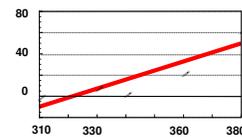
	Vomiting after admission	Stool volume in 1 st 24 hours	Recovery Time	"Failures"
Bicarbon. ORS	62%	6025 ml	46 h	35%
Citrate ORS	41%*	4252 ml*	39 h*	23%

* P<0.05

Hoffman S et al J Inf Dis 1985, 152:1159

Effect of study ORS solutions of different osmolarity on stool output

Percentage difference in stool output compared with WHO ORS



Osmolarity of study ORS solution (mmol/l)

Indonesia study – Cholera at IDH, Jakarta

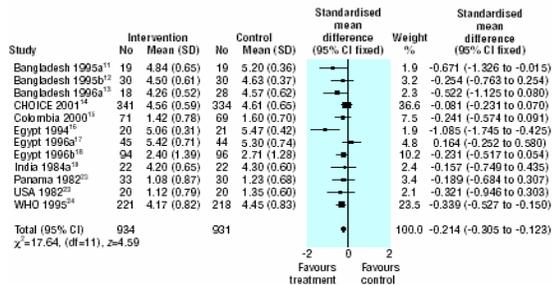
Variable	Reduced Osmolarity ORS*	Standard WHO-ORS+
Stool output (mL)		
24h after randomization	3792±2844	3894±2190
Total	4551±3251	4450±2712
ORS intake (mL)		
24h after randomization	4668±1909	4193±1596
Total	6964±3018	6464±3972
Volume of vomiting (mL)		
24h after randomization	173±372	384±690* (p<0.05)
Total	206±416	417±769

Clinical features of patients after randomization :

Variable	Reduced Osmolarity ORS*	Standard WHO-ORS+
Urine output (mL)		
24h after randomization	1067±540	893±460
Total	1761±935	1484±893
Patients requiring additional intravenous fluid infusion (%)		
	20.5	26.8
Duration (hours) of diarrhea after randomization		
	44±13	43±14

Meta-analysis of studies comparing reduced osmolality and standard WHO ORS

Stool output



In conclusion, with reduced osmolality ORS solution

- **STOOL OUTPUT, THE VOLUME OF LIQUID STOOL LOST DURING DIARRHOEA, IS REDUCED BY 12 TO 30%;**
- **VOMITING, A FREQUENT ASSOCIATE OF DIARRHOEA, IS REDUCED BY 30%, AND**
- **THE NEED FOR UNSCHEDULED IV FLUIDS IS REDUCED BY MORE THAN 30%.**

Low Osmol ORS

The group of experts recommended that:

a single ORS solution be used and that this ORS solution contain 75 mEq/l of sodium and 75 mmol/l of glucose, and have a total osmolality of 245 mOsm/l;

this reduced osmolality ORS be used in place of standard ORS for treatment of children and adults with cholera.

Composition of the New ORS - 2004

- | | | | |
|--------------|--------|------------|------------|
| • NaCl | 2.6 g | • Na+ | 75 mEq/l |
| • Na Citrate | 2.9 g | • K+ | 20 mEq/l |
| • KCl | 1.5 g | • Citrate | 10 mmol/l |
| • Glucose | 13.5 g | • Cl- | 65 mEq/l |
| | | • Glucose | 75 mmol/l |
| | | • Osmolar. | 245 mmol/l |

Zinc for the Treatment of Diarrhoea History of Research

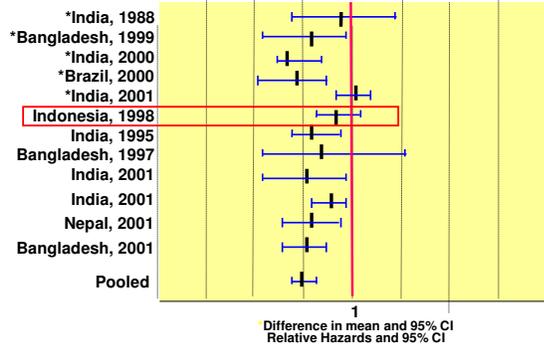
- Ongoing research from the 1990s until today
- 13 trials in acute diarrhoea
- 5 trials in persistent diarrhoea
- Age groups: 3-60 mo
- Dose of zinc: \approx 20 mg/d (range 5-45 mg/d)

Zinc for the Treatment of Diarrhoea Research Findings

- 15% reduction in duration of acute diarrhoea
- 24% reduction in duration of persistent diarrhoea
- 42% reduction in treatment failure or death in persistent diarrhoea

Zinc Investigators' Collaborative Group. AJCN 2000.

Effect of Zinc Supplementation on Duration of Acute Diarrhoea/Time to Recovery



Therapeutic Effects of Zinc on Diarrhoea Severity

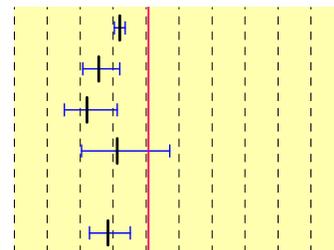
Country	Diarrhoea Outcome	Percent Reduction
India	Frequency	18
India	Frequency	39
Bangladesh	Output	28
India	Output	38
Brazil	Frequency	59

Additional Preventive Aspects of Zinc Treatment

- Zinc supplementation for 10-14 days has longer term effects on childhood illnesses in the 2-3 months after treatment
- 34% reduction in prevalence of diarrhoea
- 26% reduction in incidence of pneumonia

Zinc Investigators' Collaborative Group. *Pediatrics*. 1999.

Preventive Effect of Zinc Supplementation on Diarrhoea Incidence in Short - Course Supplementation Trials



Community-based Trial Demonstrates Zinc Effectiveness in Treating Diarrhoea

- 30 areas in rural Bangladesh randomized to ORS alone or ORS + zinc (20mg/d for 14 days) for diarrhoea treatment
- 11,880 child-years of observation during the 2 year study
- 23% decrease in duration of all diarrhoea episodes in zinc treatment clusters compared to control clusters (RH 0.77, 95% CI 0.69-0.86)

Baqui, Black, Arifeen. *BMJ* 2003.

Community-based Trial Demonstrates Longer-term Benefits of Zinc

- Zinc supplementation decreased:
 - Overall diarrhoea prevalence by 15% (RR 0.85, 95% CI: 0.76, 0.96)
 - Hospitalization from diarrhoea by 19% (RR 0.81, 95% CI: 0.65, 1.00)
 - ALRI prevalence by 7% (RR 0.93, 95% CI: 0.78, 1.10)
 - Hospitalization from ALRI by 19% (RR 0.81, 95% CI: 0.53, 1.23)

**Community-based Trial
Demonstrates Longer-term Benefits
of Zinc**

- Decreased overall mortality by 51% (RR 0.49 95% CI: 0.25, 0.94), non-injury deaths
- Decreased antibiotic use rate from 34% in control clusters to 13% in zinc clusters ($p < 0.01$)
- Increased ORS use from 50% in control clusters to 75% in zinc clusters ($p < 0.01$)

**Effects of Zinc Supplementation
Started During Acute Diarrhea in
Bangladesh***

Outcome	Zinc (%)	Control
Treated with ORS	75	50 [†]
Antibiotic use	13	34 [†]
Other drug use	15	45 [†]
Care from pharmacy	16	33 [†]
Care from village "doctors"	12	27 [†]
Care from homeopaths	6	13 [†]

Safety of Zinc Supplementation

- Toxicity: vomiting, neurologic signs with 10 grams – 500 times the daily dose – reversible
- Prolonged dose (months – years) of 5-10 X daily dose – anemia and copper deficiency
- Modest daily dose X 6 weeks – raised LDL, lower HDL – reversible
- Long daily dose – compete with iron for absorption – mild anemia in months

Safety of Zinc Supplementation

- 9,100 children less than 5 years of age studied in 18 published clinical trials
- 11,880 child yrs of observation in 1 large community trial
- Vomiting is the only reported adverse effect
 - 5/7 trials report no differences between zinc and placebo
 - 2 trials report slightly higher vomiting rates in zinc supplemented children – thought to be due to metallic taste in particular preparation
- 4 trials show no difference in copper status after 2 weeks of zinc supplementation

Global Diarrhea Treatment Policy

- Zinc has been included in the WHO Essential Medicines List for the treatment of diarrhea (March 2005)
- Zinc has been included in the Interagency Emergency Health Kit for the treatment of diarrhea (January 2006)
- Diarrhea management guidelines have been updated by WHO to include Zn (2004)
- WHO IMCI guidelines have been updated to include zinc for diarrhea management (2005)

**Indonesia one of first
programs in the world to
embrace ORS**

Is it not time to add Zinc and low Osmolality ORS?
What are the constraints?
How can we assist you to move ahead?

Terima Kasih!

Appendix 7
Country Assessment Tool

**Country Assessment Tool
for the Introduction of Zinc and
Review of Diarrhea Case Management**

Central and Field Work Sections

DRAFT
Jakarta
February 12, 2007

1. Assessment questions for the Central Level.

1.1 Assessment of Private Sector Organizational Capabilities & Infrastructure for Zinc and LO-ORS Introduction in the treatment of diarrhea

Setting the National Context: The Pharmaceutical market (from trade audits and interviews)

- Size and growth of general private sector market, Rx and OTC
- Size and growth of institutional market: public sector and NGO
- Composition, size and growth of anti-diarrheal category in both markets
- Composition, size, market share, and trends of antidiarrheal sub-categories and products in value and units
- Association of manufacturers, local and foreign
- Top companies in each market segment: Rx vs. OTC, urban vs. rural
- Typical distribution channels for Rx and OTC products
- Typical price structure of Rx and OTC products, distribution margins by channel

Assessing capabilities of key players in the market: Pharmaceutical Manufacturers and Marketers (from interviews)

1) R & D, Manufacturing Operations and Quality Assurance:

- Location of plants, research centers and # of employees in both
- Products / dosage forms manufactured, especially tablets, powder, and syrup and installed capacities. Surplus capacity or outsourcing of target products.
- Product Development capability (for dispersible tablets)
- Certifications held, WHO GMP adherence, C-GMP, QA , SOP implementation

2) Marketing

- Marketing Planning/ Product management set up
- Market research/ market analysis
- Communication, advertising, PR capabilities
- Sales training
- Product portfolio and distribution by team, fit with ORS and zinc
- Brief note on OTC marketing activities undertaken to give an idea of current practices. Direct promotion to the consumer experience
- Brief note on the rural marketing set up and experience of the company
- Past experience (if any) of handling social marketing projects

3) Sales Force

- Number of teams and number of medical reps, product assignment, geographic reach, client coverage, and promotional cycle of each team.
- Number in distribution and sales force, coverage, cycle, and coordination.
- Marketing support to each team: financial budget, promotional material, sales incentives, regional meetings
- Training, code of ethics, etc.

4) Distribution Network:

- Set up: Own regional depots/distributors /wholesalers.
- Direct geographical reach by channel: apotek, toko-obats, hospitals, dispensing doctors, and others
- Own or contracted transportation fleet
- Distribution reach in rural areas, types of channels (extent of reach of actual ORS)
- Past experience of supplying products to international organizations, governments, relief agencies etc.

5) Business Development/ Regulatory Affairs

- BD division and structure and organization
- Coordination mechanism with senior management, product development, manufacturing, marketing and regulatory affairs
- Stage of passing the baton
- Regulatory Affairs composition, track record in obtaining new drug approval

6) Corporate communication/ PR / set up and brief examples of corporate communication. (if any)

7) CSR (Corporate Social Responsibility) set up and brief examples of CSR projects undertaken (if any)

8) Associations with other international organizations:

9) Export capabilities:

- Exports set up: A brief note on marketing & business development activities undertaken to give an idea of current practices.
- Set up & penetration in the developing countries. Agents network overseas.

Assessing the meeting point of products and caregivers: Distributors and Retailers
(targeted interviews)

- Key national and regional distributors in urban and / or rural areas
- Depth of reach in geographical areas, both urban and rural
- Marketing/ merchandising activities, number of merchandisers and product demonstrators

Care seeking: Private Health providers (quantitative and qualitative research/ behavioral research, ideally attitudes and practices – Other team members input)

- Physicians: licensed and unlicensed
- Midwives
- Nurses
- Private hospitals, clinics
- Employer-sponsored clinics
- Group clinics/ HMO
- Pharmacists/ drug sellers
- Schools/ academia (Medicine, Nursing, Midwifery, Pharmacy)
- Professional Associations (Drs, Nurses, Midwives. Pharmacists)

Support infrastructure in the Private sector: (interviews, trade publications, other team members input)

- Media companies:
 - Electronic: TV radio
 - Print: Professional and public
- Communication agencies: Ad agencies, PR agencies
- Market research agencies
- Pharmaceutical Manufacturers' Association
- Health Insurance Companies
- Distributors, wholesalers and Retailers

Links with public sector (complementary interface/ synergistic info from other team members)

- Drug Regulatory Authority
 - Registration as Rx, OTC, Essential drug
- National Health Planning
- Health Education Unit/ IEC/ BCC
- Health Program: IMCI/ Diarrhea
- MOH Purchasing and Procurement/ warehousing
- Public Health delivery system

Other stakeholders: (from other team members)

- WHO
- UNICEF
- NGOs
- Others

And above all, understanding the primary target: the caregiver of the child with diarrhea (attitude, care seeking behavior, etc.)

* For reference on type of questions for the assessment, please refer to the BASICS publication “Mobilizing the Commercial Sector for Public Health Objectives” by Slater and Saade. 1996

1.2 Pharmaceutical management

1. Drug Regulatory Authority (NAFDC)

i. Regulation

- What is the mandate of the National Agency for Drug and Food Control (NADFC)?
- What is the process for registering a drug in Indonesia?
- How long does it take on average? Can it be fast tracked?
- Is zinc registered as a medicine (as against nutritional supplement)?
- Which registered zinc formulations are currently available?
- Is low osmolarity (245mmol/l) ORS registered?
- Is there any regulation to facilitate phasing out of old formulation of ORS?
- How is ORS scheduled?
- How would zinc be scheduled once introduced? What are the implications for who can prescribe or sell it?
- If a drug is pre-qualified and imported by UNICEF or other similar agency does it still need to be registered?

ii. Quality Assurance & Pharmacovigilance

- What systems exist for quality assurance during drug registration and drug procurement?
- Is there a government policy on good manufacturing practices (GMP)?
- What systems exist for monitoring and reporting adverse drug reactions (ADRs)? Are there ADR reporting forms?
- Are ADR reports routinely received? Are they used for policy decisions (review of standard treatment guidelines, restriction of use)?
- Is reporting on quality defects and ADR mandatory for Pharmaceutical industries in Indonesia?
- Is post marketing surveillance done on a regular basis? How and by whom?

iii. Human Resources (Specific to NAFDC)

- Who are the staff members and what are their roles? Is there need for external TA?
- Have human resource needs been identified?
- Are there provisions for training?

2. Directorate of Pharmacy

1. Policies

- Is there a national Essential Medicines List (EML)? What is the procedure for the updating of EML in Indonesia?
- Does the EML specify the level of use?
- Is there an updated national Formulary?
- Is there a policy on how to substitute products already in the treatment guidelines?
- Is there a policy on donation of medicines?

- What is the policy on cost recovery or subsidies on medicines in the public sector?
- Are medicines exempt from tax?
- Who was responsible for preparing IMCI guidelines?
- Who would be responsible for modifying these guidelines to include the zinc component?
- What experiences/lessons from previous introductions of new medicines and health technologies (e.g. ACT for malaria) is relevant to the introduction of zinc?

2. Quantification

- Do you conduct quantification to determine national essential medicines needs? Who does the quantification/forecasting? Is the quantification decentralized?
- How accurate and reliable are consumption/utilization records of essential medicines?
- Are consumption/utilization records of ORS routinely reported as part of the Pharmacy Management Information System?
- Is there a system for reporting essential medicines (including ORS) consumption from the peripheral levels to the central level?
- How is quantification of ORS done for diarrhea treatment? By consumption or epidemiological data?
- In the quantification, were there allowances for buffer stocks, shelf life, lead time, current inventory levels, quantities on order etc.?
- Has MOH quantification of ORS been harmonized with parallel procurement efforts of other agencies (UNICEF, World Bank, NGOs etc)?

3. Procurement

- Is procurement centralized or decentralized?
- Does Indonesia have national centralized medical stores systems? Does all public procurement go through central medical stores (CMS)? What is the capacity of the CMS to manage the procurements?
- Is there an agency that procures essential medicines on behalf of the government? What government division supports or oversees this agency?
- Are there procedures for contracting out procurement to a third party agency e.g. UNICEF, WHO?
- Is there any parallel procurement (UNICEF, World Bank and NGOs)? What drugs are procured through these agencies?
- Is there any central procurement mechanism for the NGO and faith-based organization sector?
- Does the government provide direct financial support for CMS and is there anybody else providing support?
- What are the procurement procedures? How often is procurement done? What is the time taken to prepare the order?
- Is there a system for supplier prequalification and performance monitoring?
- Who are the major suppliers to the public and private sectors?
- What is the average procurement lead time by supplier for the public sector?

- What is the cost of procurement mechanism? If done by an agency are there associated fees? Differentiate between procurement and storage fees.
- What is the rate of import tax on medicines or on imported raw materials? What percent do they constitute of the shelf price of medicines?

4. Finance and Resource Mobilization

- What are the potential sources of funding for zinc and the new low osmolarity ORS procurement?
- What is the total current budget for ORS procurement (MOH and other funds)?
- What is the total current budget needed for zinc and the new low osmolarity ORS procurement?
- Is payment for procured drugs decentralized?
- Is there a cost recovery scheme? In which facilities is it applied? Are there exemptions and how do these exemptions work? How would these apply to ORS and zinc?
- Are there price controls on medicines sold either in the public or private sector?

5. Distribution

- Is there a kit, push or pull system for essential drugs?
- Are there parallel distribution systems for distribution of certain drugs?
- How are ORS and other IMCI treatment and prevention commodities currently being distributed?
- Are there provincial, regional and districts stores? What are their roles?
- Do facilities have drugs delivered or do they have to go and fetch them?
- What is the average lead time between facilities ordering and receiving drugs?
- What is the periodicity frequency of orders/receiving?
- What is the current status of community-based treatment of diarrhea, ARI and malaria? Do CHWs provide drugs? If so which ones and how do they get them?
- Is there a system to monitor the efficiency of the distribution system? Is there a system for reporting out of stock of essential medicines?
- What are the indicators used to monitor or evaluate the distribution system? Are drugs, especially ORS generally available? What drugs are most often out of stock? At what levels?
- What systems exist for coordination between public and private sectors to improve distribution?
- Has the current pipeline of old ORS at central level, provincial, regional and district stores and also at facility level been determined?

6. Inventory Management

- What is the status of the inventory management system at central and peripheral levels? Are records computerized?

- Are physical inventories conducted? How frequently?
- Are stock cards used and up to date (accurate/correspond to physical stock?)
- What systems exist to remove expired stocks or drugs near to expiry? FEFO/FIFO?
- Are there Pharmaceutical Management Information Systems (PMIS) in place? What are they? What information is reported and to where? Is this integrated into the larger HMIS?
- What security measures are in place to prevent theft?
- What is the storage capacity and condition?

7. Transport

- Who handles the transport and distribution of medicines in Indonesia? How do the provinces and regions transport their medicines? Is this public or contracted out?
- How long does it take to arrive at the treatment facility?
- What are the constraints to ensuring an efficient transportation system?

8. Rational Drug Use

- Are there drug use surveys and/or drug utilization studies that has documented the use of antibiotics, ORS, antidiarrheals in management of diarrhea in children?
- Is there a need to investigate current antibiotic use and prescribing practices for diarrhea treatment before zinc supplements become available in order to monitor/evaluate the impact of zinc on irrational antibiotic use?
- Would there be a need for technical assistance in conducting drug utilization studies?
- What proportion of pharmaceutical officers are trained in IMCI?
- What are your key challenges in communicating information to patients on how to use a medicine?
- What types of communication do pharmaceutical officers give when dispensing ORS?
- Do you think most patients will adhere to the full course of the Zinc treatment?
- What interventions and strategies do you employ to ensure adherence to treatment?
- Would there be a need for technical assistance in developing strategies and interventions to improve adherence?

9. Human Resources (Specific to Pharmaceutical Management)

- Do Indonesia public sector pharmaceutical services have any critical human resource needs?
- Is there need for consultants/external TA?
- What are the potential challenges to the training of pharmaceutical officers in the new clinical management of diarrhea?

3. Procurement Unit or Central Medical Stores

i. Quantification

- Do you conduct quantification to determine national essential medicines needs?
- How accurate and reliable are consumption/utilization records of essential medicines?
- Is there a system for reporting essential medicines (including ORS) consumption from the peripheral levels to the procurement unit or the central medical stores?
- How is quantification of ORS done for diarrhea treatment? By consumption or epidemiological data?
- In the quantification, were there allowances for buffer stocks, shelf life, lead time, current inventory levels, quantities on order etc.?
- Has your unit quantification of ORS been harmonized with parallel procurement efforts of other agencies (UNICEF, World Bank, NGOs etc)?

ii. Procurement

- Do you procure from the entire public health facilities in Indonesia or for some areas?
- Is there any other agency that procures essential medicines on behalf of the government? What government division supports or oversees this agency?
- Is there any parallel procurement (UNICEF, World Bank and NGOs)? What drugs are procured through these agencies?
- Do you also procure on behalf of mission hospitals and some private sector?
- What are the procurement procedures? How often is procurement done? What is the time taken to prepare the order?
- Is there a system for supplier prequalification and performance monitoring?
- Who are the major suppliers to the public and private sectors?
- What is the average procurement lead time by supplier for the public sector?
- What is the cost of procurement mechanism? If done by an agency are there associated fees? Differentiate between procurement and storage fees.
- What is the rate of import tax on medicines or on imported raw materials? What percent do they constitute of the shelf price of medicines?

iii. Finance and Resource Mobilization

- Who funds your procurement for IMCI essential medicines and commodities?
- What are the potential sources of funding for zinc and the new low osmolarity ORS procurement?
- Is payment for procured drugs decentralized?
- Is there a cost recovery scheme? Are there exemptions and if so, how do these exemptions work?

iv. Distribution

- Is there a kit, push or pull system for essential drugs?
- Are there parallel distribution systems for certain drugs?
- How are ORS and other IMCI treatment and prevention commodities currently distributed?

- Do you deliver medicines to facilities or do they have to fetch them?
- What is the average lead time between facilities ordering and receiving drugs?
- What is the periodicity frequency of orders/receiving?
- Is there a system to monitor the efficiency of distribution systems?
- What are the indicators used to monitor or evaluate the distribution system? Are drugs, especially ORS generally available? What drugs are most often out of stock? At what levels?

v. **Inventory Management**

- What inventory management system do you use; manual vs computerized?
- Do stock cards or electronic inventory data usually accurate and correspond to physical stock balances?
- What systems exist to remove expired stock or drugs near to expiry?
- Which system exists for picking medicines (FEFO vs FIFO)?
- What security measures are in place to prevent theft?
- What is the storage capacity and condition?

vi. **Transport**

- How are drugs transported from your unit to the peripheral stores and then to the facilities? How long does it take for the medicines to reach the facilities?
- Is the transporting of medicines contracted out?
- What are the constraints to ensuring an efficient transportation system?

4. **UNICEF/Worldbank/NGOs**

- Do you procure ORS for the MoH? Are you required to register them?
- If so is it the new formulation?
- Do you register medicines you procure or do you have a waiver?
- Do you have the capacity to handle procurement of zinc?

1.3 Health Services Decentralization

What was the political purpose of decentralization?

What are the health sectoral goals for decentralization?

Distribution of authority and responsibility

- What specific authorities or responsibilities were retained for the center?
- What specific authorities or responsibilities were decentralized to the provinces?
- What specific authorities or responsibilities were decentralized to the districts?
- Are there notable areas of ambiguity?

Financing of district services:

- What are sources of funding and their purposes?
 - From center (tied and/or untied), locally generated taxes or fees, international donor.
- Who decides on allocation and use, at what level?
- How well does this work?
- What are consequences for human resource management, transport, reporting, etc?
- What are unexpected consequences?

How does decentralization affect:

- Pharmaceutical policy, standards, financing, procurement, distribution and management?
- Disease control, especially diarrhea?
- Child health / IMCI, clinical standards and quality of care?
- HR – hiring/firing, discipline, preservice training, in-service training?
- HMIS?

1.4 Case Management of Diarrhea

Policy and Programs

- Which sections of the MoH are responsible for: Hospitals, Puskesmas and Pustus, Posyandus, MCH, disease control and diarrhea?
- What policy documents are important for clinical standards and guidelines relevant to child health and diarrhea case management?

Human Resources and Finance

- What plans are there for refresher training of health workers (facility and community) that will be an opportunity to introduce zinc treatment.
- How much do different types of diarrhea treatment currently cost (include both consultation fees and drug costs)?
- How much will it cost to add zinc tablets?
- What options are there for financing the addition of zinc?

Ministry of Health IMCI Department and/or CDD Program

- To what extent have the standard WHO IMCI guidelines been modified in the country?
- What pre-service IMCI training curriculums exist for medical and paramedical cadres? Is IMCI included in all preservice curricula?
- What is the current IMCI in-service training curriculum?
- Has there been a recent review of the national IMCI program? If so, what were the main findings and recommendations?
- Is there a program for diarrheal disease control that is separate from IMCI?
- Which organizations in the country are involved in promoting and funding the use of IMCI guidelines?
- When did the program start? What proportion of health workers have been trained in IMCI procedures? Does this proportion vary across different regions of the country?
- What proportion of sick children who are brought to health facilities are treated according to IMCI guidelines? Is this proportion increasing, decreasing, or steady?
- What is the standard treatment given to children brought to health facilities with acute diarrhea? How about children with chronic diarrhea?
- Is the standard practice to use packets of ORS or to teach care givers how to make home made "sugar salt solution"?
- Are there plans to modify other components of the IMCI protocol e.g. malaria treatment?

1.5 Health Promotion and Behavior Change

Health Promotion Division, MOH

- Which section(s) of the National MOH are responsible for health promotion and the production of health promotion materials and media?
- Is there a national coordinating body to test and approve standard health messages for the country?
- What is the role of the Health Promotion Division? What are the main activities at present? Who funds these?
- Which unit(s) are responsible for health promotion regarding diarrhea case management and child health?
- Under the decentralized system, what are the different roles of the National MOH, the provincial health offices and the district and municipal governments? How do materials and funds move between them?
- What is the capacity for designing, modifying, testing and producing materials at provincial and district levels?
- What materials exist on diarrhea case management? Has their effectiveness been evaluated?

1.6 Health Information System

- How are data collection and transmission organized within the MOH
- Which data are available on the control of diarrhea diseases? (Cases seen, treatment, stock of ORS)
- Do the forms contain the IMCI classification?
- How are data processed? What is the frequency
- What uses are made of data? Any retro information? If yes, what is the frequency?
- Any examples of data utilization for action? Any example for diarrhea diseases?
- Is it possible to modify data collection forms to add a new compound? If yes, what is the process?
- Are there any data generated at community level? If yes, are there any community based data integrated into the district and national data? If yes which data?
- What are the challenges to managing data at central and peripheral levels?

2. Provincial and District Health Offices

2.1 Organization of Health services

Distribution of authority and responsibility for child health (IMCI), disease control, health promotion and nutrition:

- What specific authorities or responsibilities were retained for the center?
- What specific authorities or responsibilities were decentralized to the provinces?
- What specific authorities or responsibilities were decentralized to the Kabupaten?
- Are there notable areas of ambiguity?

Financing of Kabupaten services:

- Especially disease control, IMCI, health promotion, nutrition, training
- What are sources of funding and their purposes?
 - Who decides on allocation and use?
 - How much discretion does the Kabupaten have? How well does this work?
 - How much money do you have for in-service training and supervision? Is it tied to particular programs?

How has decentralization affected:

- Pharmaceutical financing, procurement, quality of drugs, distribution and management?
- Disease control, especially diarrhea?
- Child health and IMCI, quality of care?
- HR – hiring and deployment of staff, in-service training?
- Health information system?

2.2 Case Management of Diarrhea and BCC.

1. Province:

- Policy on case management:
 - Does it include zinc or LO ORS? Get a copy.
- IMCI protocols and adaptations.
 - Do they have them? Do they include zinc? Get a copy.
- HMIS: Data on cases, ORS use or deaths?
- Any surveys on pediatric diarrhea, use of ORS, home fluids, other treatments, seasonality, hospitalization rates, case fatality rates, or nutritional data?
- Does the province support and finance any behavioral change/health education campaigns? When was the last one on diarrhea?

2. Kabupaten:

- Who is responsible for diarrhea? Percent of time spent on diarrhea? What are other duties? Interactions with nutrition, prevention, MCH, or Posyandus?
- What do they know about zinc or LO ORS? Do they have either? Can they get either? If available, would they have local funds to buy them?
- Supervision activities: frequency, opportunities for training at Pukesmas, any reports?
- Outbreak response plans for diarrhea? Any experience? Are stocks of Oralit available?
- Any special cultural beliefs about diarrhea in this area?

- Are there health education sessions in health facilities? What are the principal materials, messages, and monitoring methods used?
- Is mass media used (radio, television)? How often? What are the principal messages and monitoring methods used?

- What are the functions of the Posyandus and health kaders?
- What are they doing for the prevention and treatment of diarrhea?

2.3 Drug Procurement and Management

1. Provincial and District Procurement units and Warehouses

i. Procurement

- How are essential medicines procured? How does the procurement process work? Does the present procurement system work efficiently?
- Is there any parallel procurement (UNICEF, World Bank and NGOs)? What drugs are procured through these agencies?

ii. Quantification

- Which types of health facilities and health workers do you supply? (Including Bidan di Desa and Posyandus?)
- How is quantification of ORS done for diarrhea treatment? Are the data used for quantification precise and reliable?
- Is there a system for reporting information on the consumption of drugs (including ORS) from the peripheral levels to the provincial level?
- Are you already using the new lo ORS? Do you have stocks of the old ORS?

iii. Inventory Control

- Are there stock cards and are they updated and accurate (does the stock balance recorded correspond to the remaining stock)?
- Are the drugs, particularly the ORS, generally available? Which drugs are most frequently out of stock? At which levels are these stock-outs recorded?

3. Health Facilities

3.1 Diarrhea Case Management and BCC

1. Hospital (Kabupaten or private):

- Data: Diarrhea incidence, percent of admissions, seasonality, case-fatality rate? Is diarrhea a problem?
- Data recording and reporting on diarrhea and nutrition?
- Treatment: What drugs and medications are generally used for diarrhea in the hospital? Use of IV fluids and ORS? Is there an ORT corner? Role of mothers?
- ORS Supply: Amount used in a year or month? Would their budget allow them to purchase zinc?

2. Puskesmas / Health center:

- Do they use IMCI? Have they been trained? (Observe to see if IMCI protocol is followed)
- Treatment: What drugs and medications are generally used for diarrhea? Which is most effective? Use of ORS?
- Do mothers/caretakers normally give medicines as recommended?
- What advice (if any) do they normally give mothers on how to care for a child with diarrhea?
- ORT Corner: Present? How used?
 - How do they find out about new treatments or medicines?
 - What are some of the things that convince them to prescribe/recommend a new product or medicine?
 - Are there health education sessions in the Pukesmas?
 - How organized? How much time is spent? How many people participate?
 - What are the principal materials and messages?
- Exit interview with mother:
What was she told? Check her understanding of:
 - the treatment,
 - signs for coming back,
 - advice on breast-feeding and diet.
- What support and supervision do they provide to Posyandus?
- How often? All of them?
- What support and supervision do they provide to the Bidan di Desa (VMW)?

3. Private practice:

- Independent practitioner or also works for government?
- What medications does s/he use for diarrhea? What drives the choice?
- What do clients expect of the doctor? Do they make demands on doctor?
- Is LO ORS available in pharmacies/shops?
- How do they find out about new treatments or medicines?
- What are some of the things that convince them to prescribe/recommend a new product or medicine?
- Has s/he heard about zinc in the treatment of diarrhea in children? What?

4. Drug store:

- How would they treat a child of 18 months with diarrhea?
 - What is recommended, in what order? How much does each cost?
 - What do consumers prefer or expect? What will they pay?
 - How many days' supply of medicine is provided?
 - (Observe meetings between pharmacists and their clients if possible.)
- Who determines what the drug store stocks? Detail men?
- What types of communication do they receive when a new product is introduced on the market?
- Observe whether there are communication materials in pharmacies, stores or depots where pharmacists work.
- How much ORS do they sell compared to other treatment for diarrhea?
 - Is it difficult to sell? Do people like it? Do they ask for it?
 - Is it profitable to sell?
- If a zinc product to stop or prevent diarrhea were available,
 - Would they like it?
 - Would they promote it, - in place of antibiotics?
 - Would they sell it along with ORS?

3.2 Drug Management

(In-depth investigation by Drug Management team member)

i. Health Center Pharmaceutical officer

- **Quantification**

- Who does quantification? How is quantification of ORS done for diarrhea treatment? Are the data precise and reliable?
- Determine whether quantification includes buffer stocks, the expiry dates of the products, the procurement lead time, the levels of remaining stocks, and quantities on order.
- Is there a system for reporting information on the consumption of drugs (including ORS) from the peripheral levels to the central level?
- What is the existing quantity of old formulation ORS stock?

- **Distribution**

- How are essential medicines distributed? Are they delivered to the facilities or do the facility staff have to collect them?
- How long on average is the time between ordering and receiving drugs? What is the frequency of the orders?
- Who currently treats diarrhea and malaria at the community level?
- Do community health workers provide drugs? If so, which drugs and how do they obtain them?
- Is there a mechanism to monitor the distribution system? If so what indicators are used?
- Are drugs, particularly the ORS, generally available? Which drugs are most frequently out of stock? At which levels are these stock-outs recorded?

- **Inventory Control**

- Are there stock cards and are they updated and accurate (does the stock balance recorded correspond to the remaining stock)?
- Are physical inventories of stock carried out? If so, at what frequency?
- Is stock rotated according to first expiry first out (FEFO)? Is there a mechanism to dispose of expired stock or to move drugs that have a short shelf life?
- Is there a Pharmaceutical Management Information System (PMIS)? What information is reported and to where? Is this information integrated into the larger HMIS?
- Are there Standard Operating Procedures (SOPs) in place?

- **Rational use**

- What are your key challenges in communicating information to patients on how to use a medicine?
- What types of communication do you give when dispensing ORS?
- Do you think most of your patients will adhere to the full course of the Zinc treatment?

- What interventions and strategies do you employ to ensure adherence to treatment?
- Will you require support on how to improve adherence?
- Do you have ADR forms? Do you complete and send these forms prn?
 - **NGOs, faith-based and private hospitals and Pharmacies**
- How are essential medicines procured? How does the procurement process work? Does the present procurement system work efficiently?
- What do you do when the procurement system does not work
- How do you ensure the quality of your essential medicines?
- Do you implement the national EML? Are there pressures to adopt other standards?
- Are you currently stocking Zinc? Which of your patients get Zinc?
- How do you counsel patients you dispense ORS?
- Does your clinic stock and dispense medicines (dispensing doctor)?

3.3 Drug Management

(Abbreviated tool for other team members)

Health Center/Puskesmas Pharmaceutical officer

i. Quantification

- Who does quantification? How is quantification of ORS done for diarrhea treatment?
- Have you had a stock-out of ORS? What was the reason?
- Is there a system for reporting information on the consumption of drugs (including ORS) from the Puskesmas to the district/province level?
- What is the existing quantity of old formulation ORS stock?

ii. Inventory Control

- Are there stock cards and are they updated and accurate (does the stock balance of ORS recorded correspond to the remaining stock)?
- Do you provide drugs to the Village Midwives and Posyandus? Which ones?
- Do you have a way of monitoring the use of the drugs you give to the Bidans and Posyandus?

iii. Rational use

- Which medicines are prescribed most often by doctors for diarrhea?
- What are your key challenges in communicating information to patients on how to use a medicine?
- What types of communication do you give when dispensing ORS?
- If a child with diarrhea was given zinc tablets to take one each day for ten days, how often would the mother complete the ten days?
- Do you have Adverse Drug Reaction forms? When do you complete and send these forms?

4. Community

4.1 Village Midwife/ Bidan di desa

- In addition to pregnant mothers, do people bring sick children to her?
- What are the main problems that she sees in children? Much diarrhea?

- If a mother brings an ten month old child with diarrhea, what does she advise the mother?
- When does she advise the use of ORS?
- Does she have ORS or other medicines to give to the mother? From where does she get them?
- Has she had any training in child health or IMCI? (Note what and when?)
- How much does she charge for treating children? Who decides on how much to charge?

- Does she have health education materials? On diarrhea?

- How does she work with the kaders and the Posyandu? (some details)

4.2 Toko Umum (Drug Store):

- What medicines are sold for diarrhea in children?
- Is ORS sold? How much?
- For what sicknesses is it sold? How does seller recommend it?
- Do people ask for it?

4.3 Posyandu (Weight-monitoring & child health gathering in village): -

Community mothers

- When was the last time the youngest child had diarrhea? What did mother do? (Probe on home treatment; seeking treatment outside; what she got; was she satisfied; the cost.)
- Home solutions: How is LGG made? What other fluids are used, and what are benefits of each?
- When do they use ORS, and why? Is it available in the community?
- If they are worried about the child, to whom do they go for treatment and advice?
 - What sort of treatment do they expect?
 - What sort of advice do they usually receive?

- Would they be willing to a medicine once a day for two weeks to reduce the risk of diarrhea in the next three months?

- How often do you join in the Posyandu? What is the value of the Posyandu?

Kaders (Volunteers who lead the Posyandu):

- What have been the activities of the Posyandu during the past year? What have been particular successes?
- What are your main challenges or difficulties?

- Was there a lot of diarrhea in the community? How often do mothers ask your advice?
- What is the usual way of managing diarrhea? When is ORS necessary?
- Who can supply ORS in the community? How much does it cost?
- What medicines and supplies does the Posyandu have? Who supplies them?

- How often do you get a visit from someone at the Puskesmas?
- What do they do when they come? What is the most useful thing they do?
- When did the kaders last receive any training?

Appendix 8
**Presentation from the Assessment Team to the Joint
Stakeholders Meeting**



Assessment for Implementation of Zinc in Improved Diarrhea Management in Indonesia

Zinc Assessment Team
BASICS—Basic Support for Institutionalizing Child Survival

February 26, 2007



Assessment Team Program

- Orientation by Zinc Task Force
- Meetings with MOH in Jakarta
- Field visits:
 - Health Offices
 - 7 provinces and 13 districts and municipalities
 - Hospitals, puskesmas, private doctors, Bidans, pharmacies
 - Posyandus, kaders, community members
- Pharmaceutical companies



1. Indonesian health care providers and patient caretakers are ready for zinc:

- Those with experience of zinc therapy are convinced:
 - Researchers have demonstrated its benefits
 - Providers and caretakers who used zinc following the disasters in Aceh and Yogya
- Demand for a "treatment" for diarrhea is universal.
 - ORT given at home at beginning of diarrhea
 - Caretaker wants "treatment" (antidiarrheal, antibiotic, probiotic) from the health worker if the diarrhea continues or the child is sick



2. Pharmaceutical Industry needs encouragement to produce zinc products

- Those companies spoken to show interest in zinc.
- Three are developing zinc products,

BUT:

- Need a clear indication that MOH intends to use zinc in management of diarrhea



3. Health authorities are ready to implement program when policy comes from MOH

- Policy letter from Minister for Health
- Inclusion of Zinc and Zinc therapy in policy documents:
 - Essential Drug List
 - Standard management protocols in hospitals and puskesmas
 - Etc



4. Change in diarrhea management by providers and caretakers will need support

- Simple poster emphasizing ORT, Zinc therapy and continued feeding
- Information sheet on zinc for health workers
- Preservice and In-service training curricula to include zinc therapy.
- Monitoring by Directorate of Rational Drug Use



Summary

- Letter of request from MOH to pharmaceutical industry for zinc products.
- Policy letter from Minister for Health at appropriate time.
- Agreements with DGs for:
 - Changes in relevant Policy documents
 - Changes in training curricula
 - Coordinated promotion and monitoring of new diarrhea therapy in health care programs

Appendix 9
Zinc Task Force Meeting, February 28, 2007
Attendance List

Present:	Position/Organization
Rosmini Day	P2ML, MOH
Wayan Widaya	SubDit Diare, MOH
Wita Nursanthi	YanMed Specialist, MOH
Awi Muliadi W.	Binkesmas, MOH
Yulia Purwarini	Badan POM, MOH
Darmayanti	Binkesmas, MOH
Ewing Budihartati	Kimia Farma
Yuswadi S.	Pr. Phaporas
Pang Rangga Sudira	Promkes, MOH
Agung Kisworo	Kimia Farma
Sri S Nazar	IDAI, MOH
Sunarko	Binkesmas, MOH
Hanny Roespandi	WHO
Ria	Yanmedik Dasar, MOH
Hilda Yani	Indofarma
Inti Mujjati	Binkesmas, MOH
Zorni Fadia	Bina Farmasi, MOH/HKI
Elvianti Martini	HKI
Yah Suh	IKA UG/BKGAI
Yati Soenarto	Representative of the Indonesian Coordinating Board/Body for Pediatric Gastroenterology & Hepatology
Subiyanto	Representative of the Indonesian Coordination Body/Body for Pediatric Gastroenterology & Hepatology, Indonesian Pediatric Society
Jhon Marbun	Health Office
M Mumawaroh	Indofarma
Greg Adams	USAID/Indonesia
Sri Durjati Boedhartjo	USAID/Indonesia
Iain Aitken	MSH/BASICS
Camille Saade	AED POUZN
Jon Rohde	MSH/BASICS
Jude Nwokike	MSH/BASICS
Fred White	BASICS
Joan Schubert	BASICS
Katherine Farnsworth	BASICS

Appendix 10
**Advocacy on New Clinical Management of Diarrhea in
Indonesia**

Advocacy on New Clinical Management of Diarrhea (Zinc/New ORS) in Indonesia

For Policy Makers

Dr. Wayan Widaya

I. ACTION STEPS

1. Advocacy to MOH (28 Sep '06); ongoing with other stakeholders
2. Form National Task Force for New Clinical Management of Diarrhoea; Zn/ ORT (end Oct '06)
 - Members of the Task Force (attached)
 - Develop POA
3. Engage manufacturers for Zn/LO-ORS production
 - Develop formulation
 - Prepare dossier for registration at FDA (6-9mths for approval)
 - Plan for production
 - Production after Indonesian FDA (BP POM) approval

ACTION STEPS (Cont)

4. Plan/conduct assessment (by April '07)
 - Gather existing clinical and scientific evidence, training and IEC materials
 - Review/ operational research on current Zn/new LO-ORS experience (Disaster's area: Aceh's Tsunami, Yogya's earthquake, etc.)
5. Stakeholder Workshops to disseminate findings and recommendations. (By May '07)
6. Implement activities
7. Monitoring & Evaluation activities
8. Review meeting

Members of the Task Force

1. MOH:

DGs:

- CDC & EH
- Community Health: Nutrition, Child Health,
- Center for Health Promotion
- Medical Care: Basic Med. Serv.&Specialistic Medical Services
- Pharmaceutical Services.

Task Force Members

2. PROFESSIONS, ASSOCIATIONS

- IDAI (Indon Pediatrics Society) & its Collegiums & Working groups of: Gastrohepatology, and Nutrition & Metabolic)
- BKGAI (Coordinating Board of Indon Pediat Gastroenterology)
- IDI (Indonesian Medical Association)

3. Private Sectors

- Pharmaceutical Industries
- NGOs, INGOs, Donors, UN (WHO, UNICEF, etc)

Core of Task Force

- MOH: DGs of CDC-EH, Comm Health, Medical Services, Pharmacy Services
- Professional org: IMA (Indo Med Ass), IPS (Indo Ped Soc), BKGAI (Coord Board of Indonesian Ped Gastro)
- Private sectors: (Pharmactcl Industries, UN, NGO/INGO)

Key Challenges

1. **Drug compliance (Health Promotion)**
2. **Weakness Integrated Post (Pos Yandu)**
3. **OTC of Zinc (product side)**
4. **Zinc & Fe competitive absorption if more than 6 month use**
5. **Dispersible & Tasteless (product side)**

5 lessons of Oralit

- Professional support – BKGAI, research, meetings, publication in BI,
- Govt support – policy, programs, provision of ORS
- Production, Promotion in Private sector
- Professional education curriculum – Docs, bidans, perawat – ORT corners – experience
- **Problem: introduced too low too soon – Kaders, Posyandu, Paket Gizi etc – so Docs reluctant to support – 2nd class Rx**

Continued Problem of High Incidence of Diarrhea

- Lack of exclusive breast feeding to 6 months
- Sale of infant formula in government health facilities (legality?)
- Advertisement of milks for young infants (0-6 months of age) – especially for LBW, to avoid allergy, etc
- Support to professional societies by industry (legal?)

Possible Strategies in Order of Introduction (the Ps)

- **Product** – fast track registration of Zinc for treatment of diarrhea
- **Policy** – SKMentri – to make it “official” – request to pharm industry to make available
- **Programs** – include in ALL DGs guidelines–
 - BinKesMas :gizi, anak,
 - YanKesMas: hospital services, Puskesmas
 - CDC: Diare
 - YanFarm: DOEN – Standard treatment guides
 - Health promotion

Possible Strategies in Order of Introduction

- **Professionals** – IDAI, IDI, PDKI, IBI – promote and support in terms of op research, meetings, publications, curriculum etc
- **Promotion** –Uniform simple message: Poster and print (for hospitals, facilities), Pharm industry: target multiple audiences
- **Posyandu** – revitalization, Desa Siaga, Kader retraining, (nanti dulu – don’t rush!)

Appendix 11
Case Management and Behavior Change



Case Management and Behavior Change

Findings in the Field, Issues and Challenges



Findings Field Visits: Health Seeking Practices and Treatment

- Diarrhea common - #2 in outpatients, #1 in hospital.
- Diarrhea is being taken care of first at home using home fluids & ORS. (Kaders only provide advice and ORS packets.)
- 50%-60% go to health worker for treatment or to purchase medicine if the diarrhea persists or there are other symptoms.
- When seeking treatment from a health worker, mothers expect anti-diarrheals and antibiotics to "stop the diarrhea". Many mothers are afraid of diarrhea and regard the loss of body fluids as dangerous.
- Pojok Oralit rarely used in either puskesmas or hospitals.



Findings Field Visits

- In hospitals, IVs given to nearly 100%, and antibiotics to 80% children with diarrhea.
- Diarrhea medicines in all drug stores,
 - Oralit widely available but rarely recommended – no prestige, no profit.
 - Drug sellers' practice influenced by doctors' prescriptions.
- Health professionals positively influenced by:
 - Teachers and professional associations
 - MTBS training
- Nurses most affected by what they see doctors prescribe, regardless of government program guidelines.



Findings from Field Visits: Experiences with Zinc therapy

- Zinc in trial areas of Aceh and Yogya well accepted and demand already high for more.
- Health professionals want to be confident that zinc and ORS are enough. If they are confident about the products they will be more likely to drop prescribing anti-diarrheals and antibiotics rather than just adding zinc to the current combination of drugs.



Fieldwork Findings:

Health Promotion: Structure and Services

- **National:** A lot of health promotion materials on many topics. Developed by Health Promotion, Nutrition, Child Health etc.
- Often packed with detail and serve as reminders for health workers rather than BCC materials for public.
- **Province:** Receive messages, guidelines and materials from the national level. They are encouraged to adapt materials but this takes time and money.
- **District:** All kinds of print materials "dropped" by province for distribution; Hard to get them out to puskesmas and posyandu.
- **Puskesmas and posyandu:** Face to face communication is a good way to influence caretakers.
- Lots of slick adverts out there for vitamins, etc that make people strong and smart.



Issues and Challenges:

- How to provide health professionals with the evidence about what zinc does and how it does it, including evidence from Indonesia.
- The most effective ways to reach and change the diarrhea management practices of:
 - Hospital staff
 - Child health staff in puskesmas and pustus
 - Bidan di desa and Bidan dilema
 - Sales staff of pharmacies and drug stores
- The best ways to give the child the first treatment at the outpatient clinic, and teach the mother how to give zinc tablets, ORT and continue feeding.
- The best ways to educate parents about the three essentials of diarrhea management: ORT, zinc therapy and continued breast feeding and diet.



Group discussion objectives

- Decide what needs to be done to address the issues and challenges.
- Decide who is responsible for doing those actions or activities.
- If possible, decide when they should be done.
- Are any special resources needed?

Appendix 12
Pharmaceutical Management

Pharmaceutical Management

Findings from the field, Issues and Challenges

Key observations at the Center

- **BPOM** has the capacity
 - to ensure fast-track evaluation and registration of Zinc
 - to support information on a new product (NDIC is state of the art)
- **Pharmaceutical services**: revision of critical documents due
 - Daftar Obat Esensial Nasional (DOEN)
 - Pedoman Informasi Obat bagi Pengelola Obat di Puskesmas
- **Central Warehouse** keeps about 3% national drug needs (vvEDL) mainly as buffer
- **Vertical programs** procure & distribute independently; results in overstocking and gaps in the supply chain

Key observation at the Province/Districts

- District coordination for quantification and forecasting of need is weak.
- Drug management practices vary across districts but the LPLPO works well.
- Distribution channels are multiple.
- District Hospitals can buy independently.
- Provincial buffer stocks exists but expiration & Stock outs of Oralit do occur.
- It is not clear who is responsible to provide some drugs for the buffer stocks.

Key observation at the Facilities

- Old Oralit in use in some facilities and in others both old and new lo Oralit in use
- Stock cards are not in use in most facilities:
 - Min/Max, expirations not being monitored
 - DUS and rational use not monitored
- ADR reporting weak
- Training for the Dispenser on Zinc requested

Issues arising

- Pre-registration of zinc to decide evaluation path and completeness of documents
- Zinc inclusion in DOEN and STG
- How can coordination of quantification and procurement be improved at district level?
- What is required for the rational use monitoring of drugs in the management of diarrhea?
- How to improve drug management of lo ORS and Zinc in the facilities
- Funding for the procurement of Zinc in the District?

Group discussion objectives

- Decide what needs to be done to address the issues and challenges.
- Decide who is responsible for doing those actions or activities.
- If possible, decide when they should be done.
- Are any special resources needed?

Appendix 13
Indonesia Zinc Manufacturer Assessment

INDONESIA ZINC MANUFACTURER ASSESSMENT

Name	Sales Revenue in US \$000	Production Facility	Anti-Diarrhea	Distribution	No. of Medical Representatives	Remarks
		GMP standards	Product line			
PT Kalbe Farma Kawasan Industri Delta Silicon Jl. MH Thamrin Blok A3-1 Lippo Cikarang Bekasi 12550 Ph.: 6221- 8990 73333 to 37 Rank # 1	354.543 40% come from Rx-products	x	Entrostop (activated colloidal attapulgite 650mg plus pectin 50mg) intest. Absorbant (tab) – TUS 5.333 Dialac anti-diarrheal micro org – sachet 1g – TUS 141 Motilex motility inhibitor – film-coated tab 2mg – TUS 122 Oralit oral electrolyte replacer – TUS 2	PT Enseval - nationwide reaching over 180000 outlets with a sales-force of over 4000 persons, 60 branches and 40 distribution centers	1900 MedReps	JB Apik Ibrahim Managing Director apik.ibrahim@kalbe.co.id Rikrik A.M Ilyas Director Business Development rikrik.ilyas@kalbe.co.id Johannes Setijono President Director isetijono@enseval.com
PT Sanbe Farma Jl. Taman Sari 10 Bandung 40116 Ph.: +6222-420 7725 Rank # 2	187.967 mainly prescription drugs (TUS 154.378)	x TGA- inspected	Lodia (loperamide) motility inh. - tab film ctd 2mg - TUS 125 Neo Kaolana (kaolin+pectin) - suspension intest. Absorbant - TUS 37	PT Bina San Prima 35 branches and 60 depots nationwide Over 1100 sales persons	650 MedReps	Contact persons: Devanand Seelam GM Exports and Business Development Mobile: +62811-213671 sdevanand@sanbe-farma.com Husni Azhar Manufacturing Director azharh@sanbe-farma.com
PT Dexa Medica/Ferron Block J-3, Jababeka Industrial Estate Jl. Jababeka VI Cikarang Ph.:+6221- 7884 3663 (Marketing) Rank # 3	187.716 91% come from Rx-products	x	Dexdiar intest. Absorbant (tab) – TUS 1 Oralit oral electrolyte replacer – TUS 10	PT Anugrah Argon Medica (AAM) – 30 branches nationwide with 600 salespersons	1500 Med Reprs	Contact persons: Ferry A. Soetikno Managing Director and Owner ferry@dexa-medica.com Dr. Raymond Tjandrawinata Director Scientific Affairs and Corporate Development raymond@dexa-medica.com
PT. Tempo Scan Pacific Bina Mulia Bld. Jl.HR Rasuna Said Kav. 11 Jakarta 12950 Ph.: +6221-5201858 Rank # 4	118.143 mainly OTC (OTC sales TUSD 110.021)	x new factory of high standard	Amerol (motility inhibit.) tab 2mg - TUS 4 Viton Isoton Plus (oral electrolyte replacer)	PT Tempo 46 branches and depots servicing 4800 pharmacies 520 hospitals 12600 outlets for consumer health prod. 1300 supermarkets	200 MedReps and 150 salespersons	Manufacturing in license: Eli Lilly Contact persons: Dr. Paul Harianto Managing Director Pharma paulharianto@thetempogroup.net Evi K. Santoso Deputy GM - Ethical&Hospital eviks@thetempogroup.net

Name	Sales Revenue in US \$000	Production Facility	Anti-Diarrhea	Distribution	No. of Medical Representatives	Remarks
		GMP standards	Product line			
PT Novell Pharm. Lab Jl. Limo no. 40 Permata Hijau Jakarta 12220 Ph.: +6221-7244110 Rank # 5	93.517 (Pharos group TUS59.891 and Novel TUS 33.626) (ethical TUS 58.214)	x TGA- inspected	Lacto-B (a-d micro org.) sachet 1g - TUS 700 Lacto-Ad sachet 1 g - TUS 31 Pharolit (oral electr. repl.) pwd sachet - TUS 73 Normotil (motility inh.) tab - TUS 5 Nifural syrup 250 mg (Nifuroxazide) of Pharos TUS 471 Lazafin (intest. anti-inflamm) tab ec - TUS 41	PT Antarmitra Sembada several outside distributors	120 dedicated MedReps covering 80% of paediatricians Total Reps 650 persons	Contact persons: Roy Lembong (owner) roylembong@novellpharm.com
PT Kimia Farma (90% state-owned) Jl. Veteran no. 9 (Head-Office) Jakarta 10110 Ph.: +6221- 384 7709 Rank # 7	56.754 74% come from Rx-products	x	Bekarbon intest. Absorbant (tab) - TUS 54 Nodiar intest. Absorbant (tab) – TUS 17 Oralit oral electrolyte replacer – TUS 261	Strong in government business, owning >300 pharmacies with 300 salespersons serving almost 20.000 outlets	400 Med Reps	Sofiarman Tarmizi Marketing Director sofiarman@kimiafarma.co.id Gunawan Pranoto President Director gpranoto@kimiafarma.co.id
PT Indofarma (state-owned) Jl. Indofarma no. 1, Cibitung Cikarang Barat 17530 Ph.: +6221- 88323971 Rank #9	56.751 92% come from Rx-products	NA	Oralit oral electrolyte replacer – TUS 398 Bioralit oral electrolyte replacer – TUS 22	Mainly in government business through a lot of wholesalers; non-branded generics	330 Med Reps	Munawaroh Marketing Director general@indofarmagroup.com Syamsul Arifin President Director syamsul.arifin@indofarmagroup.com
PT Interbat Interbat Building Jl. Mampang Prapatan Raya no. 81 Jakarta 12790 Ph.: +6221-79192000 Rank # 15	40.118 mostly prescription drugs (TUS 34.439)	x upgraded to meet standard	Diagit (intest. absorbant) - TUS 42	PT APL (see above)	around 1000 MedReps	Contact persons: Hasan E. Karna General Manager hasan.ekarna@interbat.co.id Dr. Sandra Fadli Business Development Mgr. sandra.fadli@interbat.co.id
PT Combiphar Graha Atrium 12th Fl. Jl. Senen Raya no. 135 Jakarta 10410 Rank # 22	27.574 (ethical TUS 17.226)	x	Normudal (motility inh.) tab fc 2mg - TUS 13 Protexin (a-d micro org.) sachet 1 g - TUS 16 Protexin child (tab chew) - TUS 1 Protexin cap - TUS 122	PT Anugerah Pharmindo Lestari (APL) majority owned by Zuellig Pharma, Swiss-based distributor	around 500 MedReps	Contact persons: Indra Sentana Managing Director Subowo - Board Member subowo@combiphar.com

Appendix 14
Market Segmentation by Company

MARKET SEGMENTATION BY COMPANY

The Indonesian market is comprised of distinct market segments based on income levels with participants positioned distinctly against these segments

