WEEKLY EPIDEMIOLOGICAL REPORT

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Global Rotavirus Surveillance

Background

Globally, rotavirus infection is the leading cause of severe diarrhea among children aged <5 years. An estimated 527 000 children in this age group died from rotavirus infection in 2004; >85% of these deaths occurred in south Asia and Sub-Saharan Africa.

Rotavirus infects the proximal small intestine, where it releases an enterotoxin and destroys the epithelial surface resulting in blunted villi, extensive damage and shedding of massive quantities of virus in stool. The estimated incubation period for rotavirus diarrheal illness is <48 hours. The clinical spectrum of rotavirus illness in children ranges from mild, watery diarrhea of limited duration to severe diarrhea with vomiting and fever that can result in dehydration, shock, electrolyte imbalance and death.

The illness usually begins with acute onset of fever and vomiting, followed 24-48 hours later by frequent, watery stools. Up to one third of children with rotavirus illness have a temperature of >102ºF (>39ºC). Vomiting usually lasts <24 hours; other gastrointestinal symptoms generally resolve in 3-7 days.

Rotaviruses are shed in high concentrations (i.e., 1012 virus particles per gram of stool during the acute illness) in the stools of infected children before and several days after clinical disease. Rotavirus is transmitted primarily by the faeco-oral route, both through close person-to-person contact and through fomites. Very few infectious virions are needed to cause disease in susceptible hosts. Spread is common within families. Adult contacts of infected children also become infected (30%-50%), although infections in adults often are asymptomatic because of immunity from previous exposure.

Surveillance

According to American Centers for Disease Control and Prevention (CDC) guidelines, the public health importance of a disease can be measured using the following parameters:

- Frequency of disease
- Severity of disease
- Inequities associated with the disease
- Costs
- Preventability (or amenability to public health interventions)
- Public interest

The aims of surveillance vary depending on the health condition of interest and may include:

- Control the spread of disease (with public health follow up for each case)
- Estimate the burden of disease
- Monitor trends in the burden over time
- Assess the effectiveness of interventions
- Monitor changes in disease characteristics over time (e.g. change in serotypes, strains)
- Enhance understanding of the epidemiology and clinical course of the disease
- Provide a basis for epidemiologic research
- Inform policy makers.

These aspects have been taken into consideration when the World Health Organization (WHO) designed the global surveillance network for rotavirus. Standardized case definitions and laboratory methods are used at sentinel hospital sites all over the world in different WHO regions to identify cases of rotavirus diarrhoea. This article contains data collected through the global surveillance network for rotavirus from January through to December 2009.

Methodology

Any child aged <5 years who was hospitalized for treatment of acute gastroenteritis or diarrhoea in a sentinel hospital conducting surveillance was eligible for enrolment in the surveillance project. The child was enrolled if a case-report form was completed and a stool specimen was collected, regardless of whether the specimen was tested. Stool specimens were evaluated for rotavirus antigen using enzyme immunoassays, generally at the sentinel hospital's laboratory or at a national laboratory. A child whose

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specimen tested positive for rotavirus antigen was defined as a confirmed case of rotavirus diarrhoea. Rates of rotavirus detection were calculated as the proportion of stool specimens tested for rotavirus antigen that were confirmed. A median detection rate was calculated for all countries in each WHO Region as well as for all countries globally. Only countries that tested ≥100 stool specimens were included in the analysis. Furthermore, only those countries which received stool samples during all 12 months of 2009 were included in the analysis in order to account for possible seasonal variations in incidence. In 2009, 55 countries from the 6 WHO Regions participated in the global network; 43 of these countries across all WHO Regions met the inclusion criteria. In these 43 countries, an average of 3 (range1–13) sentinel hospitals per country conducted surveillance.

Results

A total of 45 932 children aged <5 years (range 1 389–16 242) across all WHO Regions were enrolled in the analysis and stool specimens from 38 580 (84%) of these children across all WHO Regions were tested for rotavirus (range 1 389–13 139) The median detection rate of rotavirus infection among enrolled children with stool specimens tested in the 43 countries was 36%. The median detection rate of Rota virus infection ranged from 25% in the Region of the Americas to 47% in the Western Pacific Region.

The rate of rotavirus infection in children hospitalized for diarrhoea in the analysis is comparable to the rates reported from the surveillance networks for period 2001-2008, in which a detection rate of 40% was found in 35 countries with similar regional and global distributions. Furthermore, a review of studies on rotavirus infection among children hospitalized with diarrhoea published during the period 2000–2004 reported an overall detection rate of 39%.

Conclusions

These high detection rates highlight the aetiological role of rotavirus infection in causing severe diarrhea in children worldwide and emphasize the need for effective interventions to control this disease as part of a comprehensive approach to the prevention and control of diarrhoea.

Limitations

The findings in this analysis are subject to some limitations. First, sentinel hospitals associated with the global surveillance network are typically health facilities that treat large numbers of children with acute diarrhea and patients at these sites may not be representative of the total population of the country.

Second, the variation in detection rates among WHO Regions may reflect true differences or may reflect differences in ascertainment of rotavirus diarrhea among countries participating in the network. [Therefore, In 2008, regional surveillance networks for rotavirus were brought under the full coordination of WHO and efforts are underway to standardize surveillance procedures (for example, by using identical case definitions) and to implement performance-monitoring indicators (for example, ≥90% of specimens received at the laboratory should be tested for rotavirus). A global external quality assessment programme was scheduled and proficiency testing panels were planned to be sent to laboratories to evaluate their ability to detect rotavirus antigen].

Sri Lanka in the Rota Virus Surveillance

Sri Lanka has been a part of the Asian Rotavirus Surveillance Network (ARSN) since 2004 and now is a part of the WHO Global Surveillance Network. Currently, Lady Ridgeway Children's Hospital (LRH) of Sri Lanka is the only sentinel site involved in the WHO's global surveillance network for rotavirus . Further plans are underfoot to expand the surveillance activities to other hospitals to identify regional variations in rotavirus infection. Genotyping and phenotyping of confirmed rotavirus diarrhoea cases will also commence in the near future.

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Sources-
Rotavirus surveillance worldwide– 2009-available from http://www.who.int/wer/2011/wer8618.pdf

Rotavirus surveillance in Australia-available from. http://www.health.gov.au/internet/main/publishing.nsf/content/cda-cdi3201k.htm

Table 3 : Water Quality Surveillance
Number of microbiological water samples - June / 2011

District	MOH areas	No: Expected *	No: Received
Colombo	12	72	NR
Gampaha	15	90	NR
Kalutara	12	72	NR
NHIS	2	12	NR
Kandy	23	138	0
Matale	12	72	NR
Nuwara Eliya	13	78	NR
Galle	19	114	NR
Matara	17	102	NR
Hambantota	12	72	NR
Jaffna	11	66	NR
Kilinochchi	4	24	NR
Manner	5	30	NR
Vavuniya	4	24	NR
Mullatvu	4	24	NR
Batticaloa	14	84	19
Ampara	7	42	NR
Trincomalee	11	66	0
Kurunegala	23	138	82
Puttalam	9	84	NR
Anuradhapura	19	114	NR
Polonnaruwa	7	42	NR
Badulla	15	90	NR
Moneragala	11	66	NR
Rathnapura	18	108	NR
Kegalle	11	66	NR
Kalmunai	13	78	NR

* No of samples expected (6 / MOH area / Month)
NR = Return not received

Table 1: Vaccine-preventable Diseases & AFP

09th – 15th June 2012 (24thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2012	Number of cases during same week in 2011	Total number of cases to date in 2012	Total number of cases to date in 2011	Difference between the number of cases to date in 2012 & 2011
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01	00	00	00	00	00	00	00	01	01	40	45	- 11.1 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Measles	00	00	00	00	00	00	00	00	00	00	03	21	70	- 70.0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	05	10	- 50.0 %
Whooping Cough	00	00	00	00	00	00	01	00	00	00	02	34	17	+ 100.0 %
Tuberculosis	213	13	09	15	10	00	20	13	19	312	127	4068	4059	+ 0.22 %

Table 2: Newly Introduced Notifiable Disease

09th – 15th June 2012 (24thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2012	Number of cases during same week in 2011	Total number of cases to date in 2012	Total number of cases to date in 2011	Difference between the number of cases to date in 2012 & 2011
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	00	00	03	01	01	00	02	00	02	09	51	2117	2335	- 09.3 %
Meningitis	00	00	00	00	00	00	02 AP=2	00	00	02	15	257	430	- 40.2 %
Mumps	00	00	00	00	01	00	06	00	02	09	36	1995	1207	- 65.3 %
Leishmaniasis	00	00	00	00	00	00	00	00	00	00	05	269	310	+ 13.2 %

Key to Table 1 & 2

Provinces: **W**: Western, **C**: Central, **S**: Southern, **N**: North, **E**: East, **NC**: North Central, **NW**: North Western, **U**: Uva, **Sab**: Sabaragamuwa.

DPDHS Divisions: **CB**: Colombo, **GM**: Gampaha, **KL**: Kalutara, **KD**: Kandy, **ML**: Matale, **NE**: Nuwara Eliya, **GL**: Galle, **HB**: Hambantota, **MT**: Matara, **JF**: Jaffna, **KN**: Killinochchi, **MN**: Mannar, **VA**: Vavuniya, **MU**: Mullaitivu, **BT**: Batticaloa, **AM**: Ampara, **TR**: Trincomalee, **KM**: Kalmunai, **KR**: Kurunegala, **PU**: Puttalam, **AP**: Anuradhapura, **PO**: Polonnaruwa, **BD**: Badulla, **MO**: Moneragala, **RP**: Ratnapura, **KG**: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008.

Dengue Prevention and Control Health Messages

You have a duty and a responsibility in preventing dengue fever. Make sure that your environment is free from water collections where the dengue mosquito could breed.

Table 4: Selected notifiable diseases reported by Medical Officers of Health

09th – 15th June 2012 (24thWeek)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	0	3178	0	49	0	5	0	87	0	24	0	66	0	2	0	26	0	2	**0**
Gampaha	0	2207	0	32	0	5	0	32	0	13	0	81	0	6	0	101	0	0	**0**
Kalutara	0	816	0	35	0	2	0	17	0	3	0	95	0	2	0	10	0	1	**0**
Kandy	0	729	0	37	0	1	0	11	0	11	0	27	0	64	0	15	0	0	**9**
Matale	0	185	0	38	0	4	0	7	0	4	0	19	0	2	0	10	0	0	**0**
Nuwara	0	125	0	63	0	1	0	17	0	1	0	14	0	331	0	9	0	1	**0**
Galle	2	455	0	36	0	3	0	6	0	10	0	59	0	21	0	1	0	0	**5**
Hambantota	0	216	0	18	0	1	0	2	0	10	0	28	0	22	0	5	0	0	**0**
Matara	0	580	0	30	0	4	0	9	0	16	0	64	0	36	0	48	0	0	**0**
Jaffna	1	201	0	85	0	6	1	175	8	27	0	2	0	235	0	4	0	0	**17**
Kilinochchi	0	20	0	6	0	1	0	18	0	39	0	3	0	26	0	4	0	1	**25**
Mannar	0	73	0	11	0	2	0	13	0	13	0	15	0	35	0	1	0	0	**0**
Vavuniya	0	30	0	7	0	19	0	6	0	5	0	14	0	0	0	1	0	0	**50**
Mullaitivu	0	5	0	8	0	1	0	4	0	1	0	2	0	5	0	0	0	0	**25**
Batticaloa	6	550	2	73	0	2	0	11	0	30	0	4	0	0	0	4	0	3	**57**
Ampara	0	54	0	41	0	0	0	3	1	5	0	16	0	0	0	2	0	0	**14**
Trincomalee	1	86	1	75	0	1	0	15	0	2	0	29	0	3	0	2	0	0	**33**
Kurunegala	10	568	0	52	0	6	0	45	0	9	0	65	0	16	0	36	0	2	**9**
Puttalam	0	352	0	23	0	4	0	5	0	1	0	20	0	9	0	1	0	0	**0**
Anuradhapu	8	163	1	29	0	1	0	4	0	2	1	49	0	18	1	35	0	1	**26**
Polonnaruw	0	82	0	11	0	0	0	1	0	0	0	18	0	2	0	26	0	1	**0**
Badulla	0	88	0	33	0	2	0	16	0	1	0	17	0	24	0	20	0	0	**0**
Monaragala	0	84	0	34	0	4	0	10	0	0	0	40	0	41	2	102	0	1	**9**
Ratnapura	87	858	0	93	0	23	0	29	0	5	0	128	0	19	0	50	0	1	**17**
Kegalle	0	623	0	27	0	7	0	12	0	5	0	53	0	29	0	207	0	0	**0**
Kalmune	1	126	0	83	0	1	0	5	0	27	0	2	0	0	0	6	0	1	**15**
SRI LANKA	**116**	**12454**	**04**	**1029**	**00**	**106**	**01**	**560**	**09**	**264**	**01**	**930**	**00**	**648**	**03**	**726**	**00**	**15**	**11**

Source: Weekly Returns of Communicable Diseases WRCD).
***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever.
****Timely** refers to returns received on or before 15th June, 2012 Total number of reporting units 329. Number of reporting units data provided for the current week: 35
A = Cases reported during the current week. **B** = Cumulative cases for the year.

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to **chepid@sltnet.lk.**

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