

APPENDICES

Rotavirus incidence in hospitalised Hong Kong children: 1 July 1997 to 31 March 2011

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Appendix 1 – Number of in-patients* in public and private hospitals by age group, 2008-2010

Type	Age group	2008		2009		2010		Average (2008-2010)
		Number	Percentage	Number	Percentage	Number	Percentage	Number (% of total)
Public ^ hospitals	Under 1	73,788	5.8	74,815	5.6	81,790	5.7	76,797(63.1)
	1-4	32,695	2.6	33,868	2.5	37,171	2.6	34,578(72.3)
	5-14	36,407	2.9	37,680	2.8	37,609	2.6	37,232(77.2)
	15-44	274,227	21.6	280,023	20.9	288,526	20.3	280,925(64.4)
	45-64	320,446	25.3	359,634	26.8	386,455	27.1	
Private hospitals	Under 1	41,004	12.0	44,746	12.4	49,002	12.8	
	1-4	12,776	3.7	12,352	3.4	14,525	3.8	
	5-14	11,089	3.2	10,532	2.9	11,362	3.0	
	15-44	150,657	44.1	155,436	43.0	159,911	41.9	
Total	Under 1	114,792	7.1	119,561	7.0	130,792	7.2	121,715
	1-4	45,471	2.8	46,220	2.7	51,696	2.9	47,796
	5-14	47,496	2.9	48,212	2.8	48,971	2.7	48,226
	15-44	424,884	26.4	435,459	25.6	448,437	24.8	436,260

Sources: Hospital Authority and Department of Health

Notes:

* On attendance basis, including discharges and deaths

^ The figures may differ slightly from those presented in Table A18 of the “Tables on Health Status and Health Services” due to different sources of data

Summary of average number of in-patient discharges and deaths in public hospital by age group

Type	Age group	Average number of 2008-2010
Public	Under 1y	76,797
	1-4y	34,578
	5-14y	37,232
	15-44y	280,925
Total (Public + Private)	Under 1y	121,715
	1-4y	47,796
	5-14y	48,226
	15-44y	436,260
Percentage of public hospital admission	Under 1y	63.1%
	1-4y	72.3%
	5-14y	77.2%
	15-44y	64.4%

Appendix 2 –Hong Kong resident population* in each age group (estimated for the middle of each year) that was used to calculate incidence rates for the 14 rotavirus seasons (July to following June) of the study

Age group	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 *
0m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
1m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
2m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
3m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
4m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
5m	5283	4550	4267	4125	3908	3133	3300	3158	3283	3550	3425	3883	3883	3081
6-11m	31698	27300	25602	24750	23448	18798	19800	18948	19698	21300	20550	23298	23298	18486
1-<2y	67896	63504	54096	50100	47700	48000	38496	41004	39000	37500	43800	42204	48204	36225
2-<3y	76296	69096	65100	55404	51000	50400	50196	41496	43500	40104	38604	45000	42996	37350
3-<4y	75396	77004	72000	66396	57996	54600	52404	53004	44196	46200	42096	41796	47604	34803
4-<5y	80196	75504	79896	73296	69204	61104	56604	54300	54996	46596	48996	45204	43800	37953
5-<10y	390600	399108	402192	401508	396408	389604	372408	355608	332784	314088	295404	282504	265284	191484
10-,14y	332292	329004	341604	348108	345312	346812	338700	334392	329892	327996	326196	315600	295104	206775
14-<18y	369600	369396	366204	355992	345804	342300	343908	346596	348204	348996	344700	341496	338796	252675

*Since August 2000, the “resident population” approach has been adopted in place of the “extended de facto” approach for compiling Hong Kong population figures. Revised population figures backdated to 1996 have been compiled. The population estimate compiled under the “resident population” approach is referred to as the “Hong Kong Resident Population”. The “Hong Kong Resident Population” comprises “Usual Residents” and “Mobile Residents”. (<http://www.censtatd.gov.hk/hkstat/sub/sc150.jsp>)

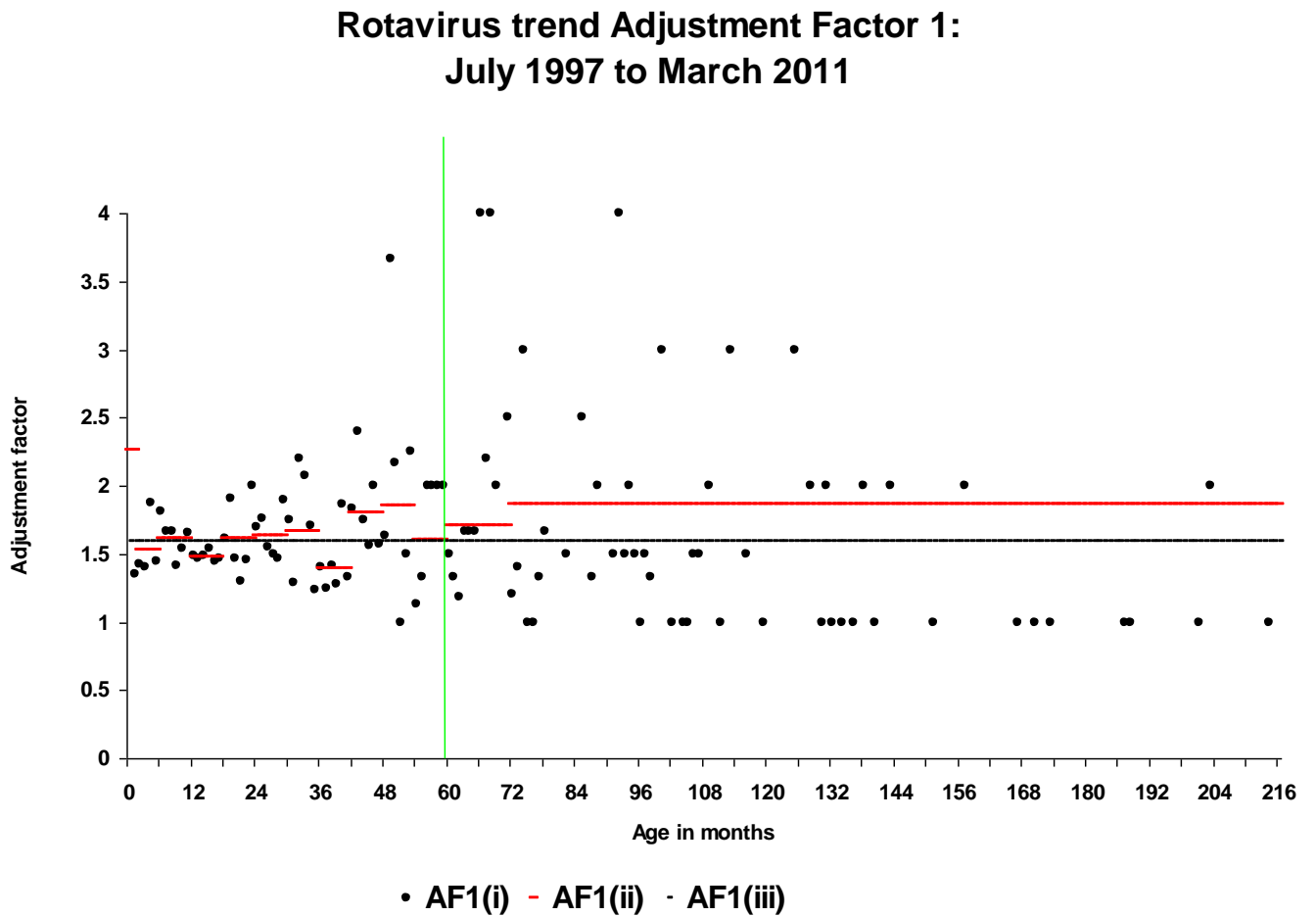
^ Population adjusted to account for shorter final study year 1 July 2010 to 31 March 2011 (9 months)

Source: Hong Kong Census and Statistics Department

Appendix 3 – Calculation of adjustment factors

The adjustment factors were derived by linking the PWH laboratory surveillance data (LAB rotavirus + or –) with the PWH CMS data (CMS rotavirus + or –):

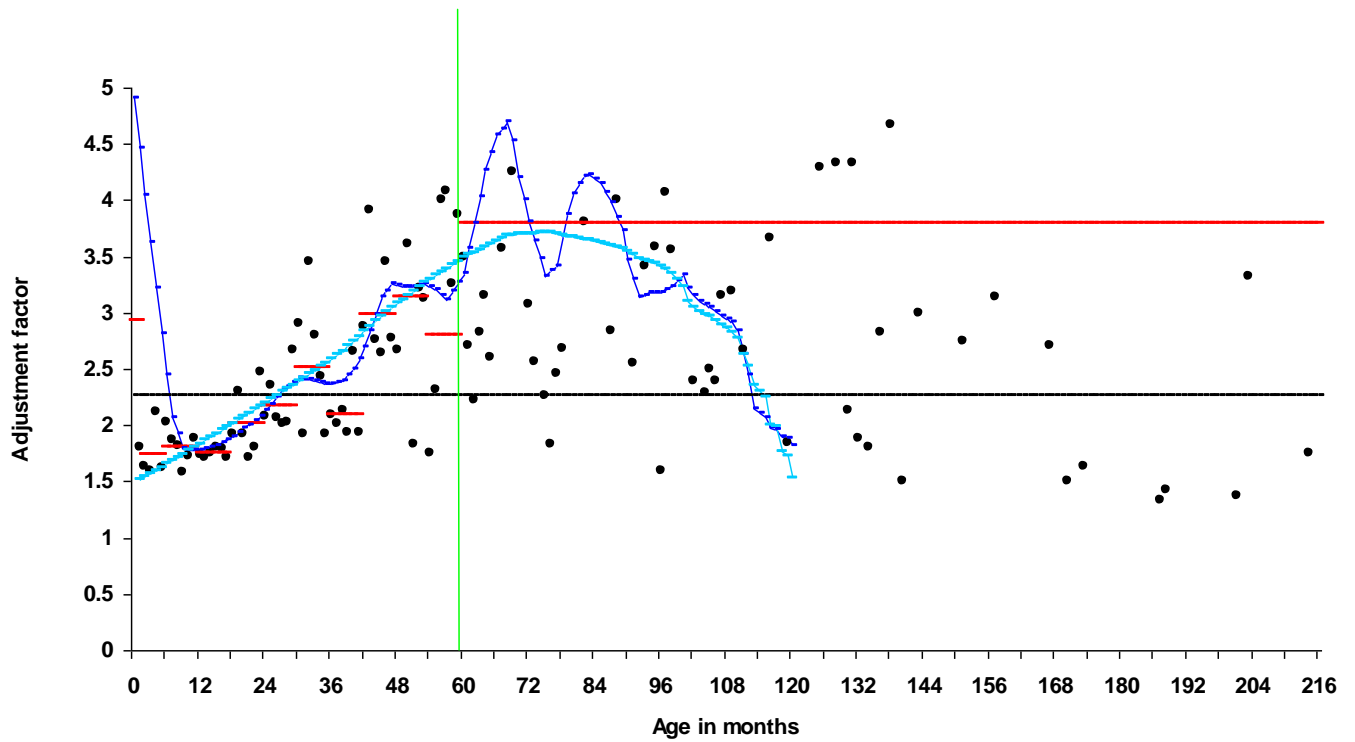
Adjustment Factor 1 : Use MEAN for data below 5 years of age (black line)



Formula for adjustment factor 1 = LAB rotavirus+ / CMS rotavirus+

Adjustment Factor 2 : Use SMOOTHED values for data below 5 years of age (excluding data from the first month of life) (light blue line)

Rotavirus trend Adjustment Factor 2: July 1997 to March 2011



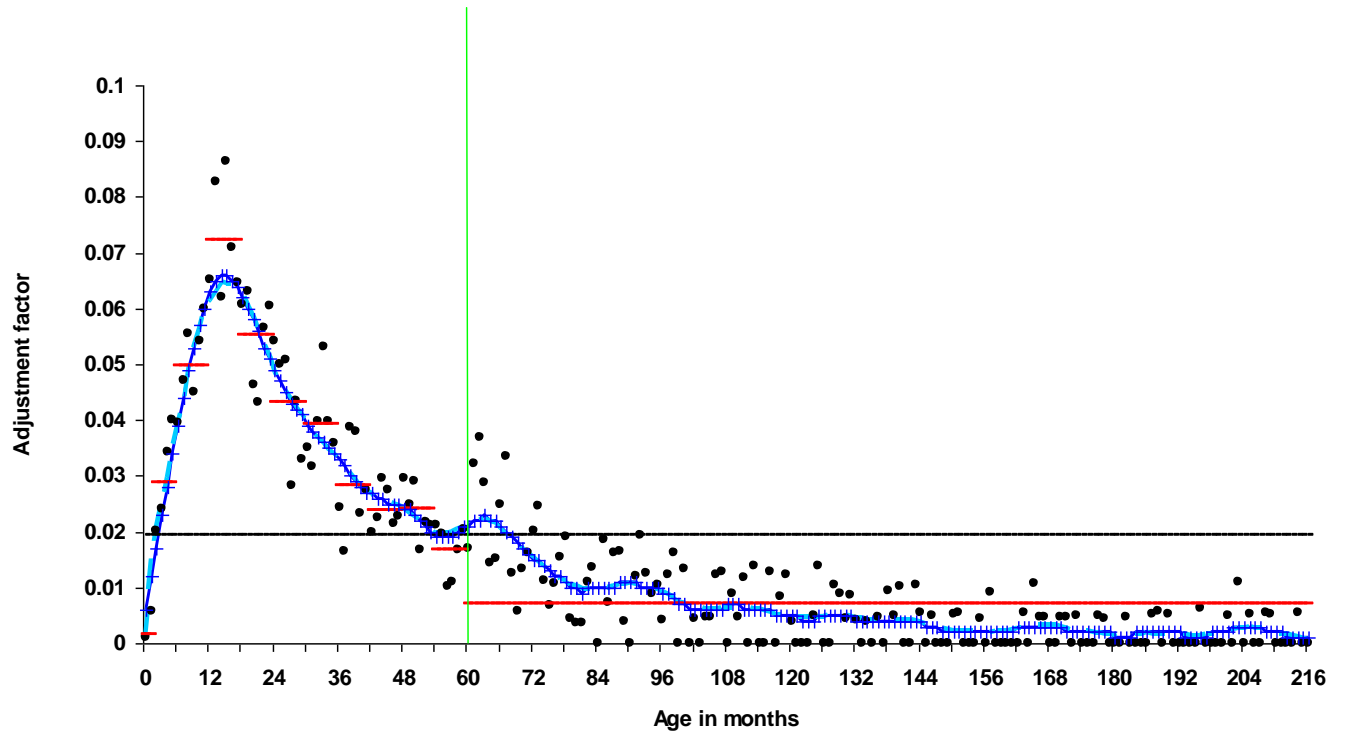
- AF2(i) - AF2(ii) - AF2(iii) - AF2(iv) -smoothed - AF2(v) - Minus 1m

*Formula for adjustment factor 2 = ([LAB rotavirus+] + [Primary gastroenteritis associated diagnosis & stool NOT sent * {LAB rotavirus+ / stool sent}]) / CMS rotavirus+*

Note: Not all the laboratory confirmed rotavirus cases had gastroenteritis-associated CMS diagnoses.

Adjustment Factor 3 : Use SMOOTHED values for data below 5 years of age (excluding data for the first month of life) (light blue line)

Rotavirus trend Adjustment Factor 3: July 1997 to March 2011



- AF3(i) - AF3(ii) - AF3(iii) - AF3(iv) - smoothed - AF3(v) - Minus 1m

Formula for adjustment factor 3 = LAB rotavirus+ / total admissions by age group

Appendix 4 – Diarrhoea-associated hospitalisations by reported diagnosis in Hong Kong Hospital Authority Hospitals (1 July 1997 to 31 March 2011)

Aetiology	ICD codes	Primary diagnosis†	Primary or secondary diagnosis‡
0 - <5 years : n=824,514			
Not specified: Presumed infectious	009.0-009.3	28,755 (3.5%)	34,598 (4.2%)
Not specified: Presumed non-infectious	558.9-789.91	16,847 (2.0%)	20,458 (2.5%)
Viral*	008.6-008.8	6,417 (0.8%)	7,705 (0.9%)
Rotavirus	008.61	10,473 (1.3%)	12,193 (1.5%)
Cholera	001-001.9	13 (0.0)	13 (0.0)
<i>Salmonella</i> species	002-003.9	6,331 (0.8%)	7,400 (0.9%)
<i>Shigella</i>	004-004.9	145 (0.0)	159 (0.0)
Food poisoning	005-005.9	141 (0.0)	149 (0.0)
<i>Escherichia coli</i> and others	008-008.5	1,398 (0.2%)	1,740 (0.2%)
Total diarrhoea		81,111 (9.8%)	97,211 (11.8%)
Total of all other diseases		743,403 (90.2%)	727,303 (88.2%)
0 - <18 years : n=1,248,297			
Not specified: Presumed infectious	009.0-009.3	35,550 (2.8%)	42,531 (3.4%)
Not specified: Presumed non-infectious	558.9-789.91	20,463 (1.6%)	24,706 (2.0%)
Viral*	008.6-008.8	7,494 (0.6%)	8,987 (0.7%)
Rotavirus	008.61	11,646 (0.9%)	13,495 (1.1%)
Cholera	001-001.9	20 (0.0%)	20 (0.0%)
<i>Salmonella</i> species	002-003.9	7,106 (0.6%)	8,285 (0.7%)
<i>Shigella</i>	004-004.9	341 (0.0%)	368 (0.0%)
Food poisoning	005-005.9	424 (0.0%)	436 (0.0%)
<i>Escherichia coli</i> and others	008-008.5	1,818 (0.1%)	2,260 (0.2%)
Total diarrhoea		104,527 (8.4%)	124,728 (10.0%)
Total of all other diseases		1,143,770 (91.6%)	1,123,569 (90.0%)

* Excludes rotavirus

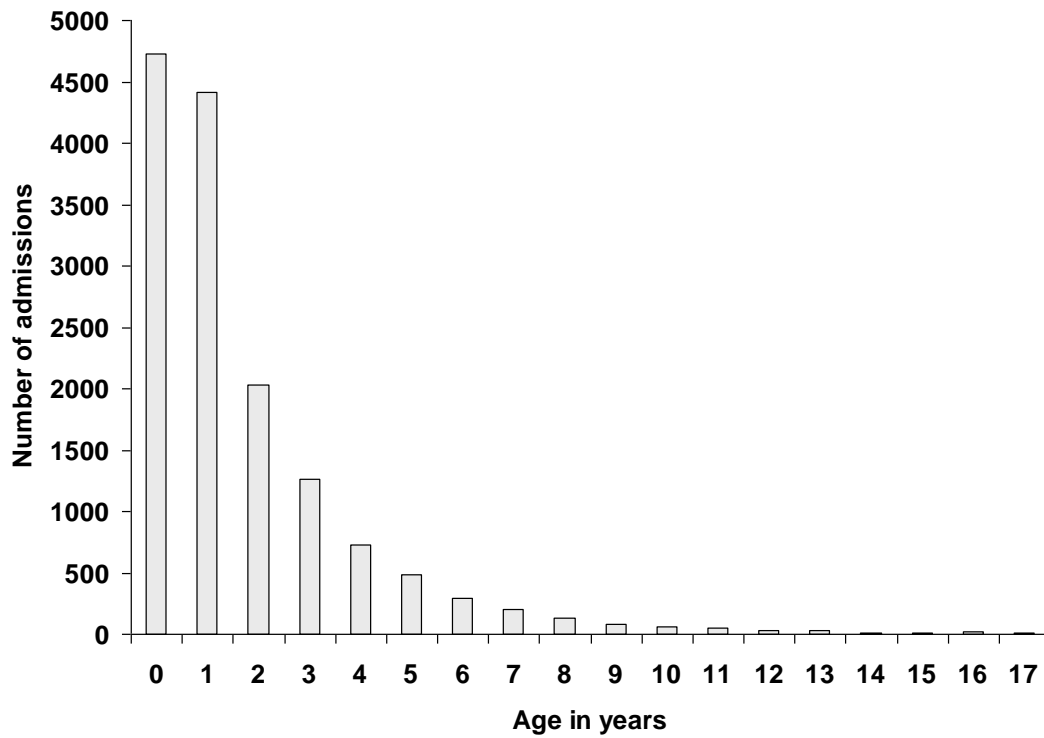
† Primary diagnosis code only

‡ Primary or secondary diagnostic codes, with category selected hierarchically when more than one diarrhoea-related code used i.e. first diagnostic code would take precedence over the second one.

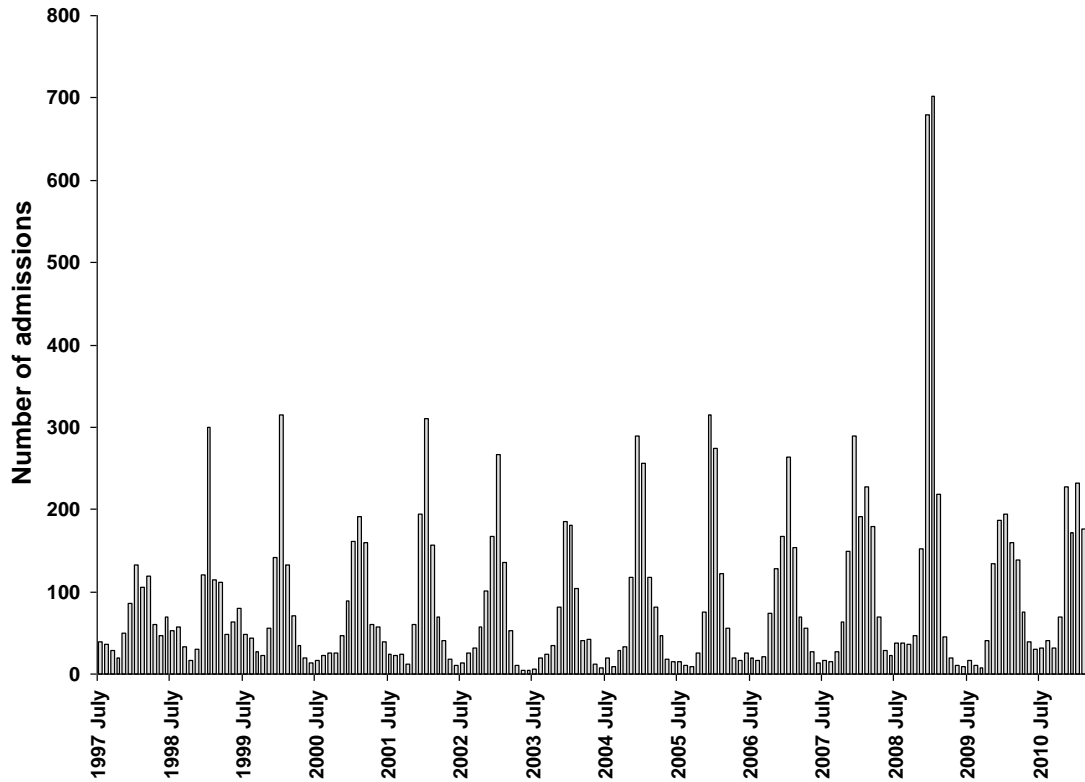
Appendix 5 – Number of hospital admissions, by hospital, for rotavirus-associated diarrhoea among children hospitalized for any diarrhoea (primary diagnosis or any one of 9 secondary diagnoses) in Hong Kong Hospital Authority Hospitals (1 July 1997 to 31 March 2011)

Hospital	Total number of admissions	Total No. (%) diarrhoea-associated admissions	Total No. (%) rotavirus admissions
0 - <5 years : n=824,514			
Hospitals providing general paediatric services			
A	29,618	5,471 (18.5)	836 (2.8)
B	51,367	7,642 (14.9)	1,240 (2.4)
C	91,713	9,774 (10.7)	2,171 (2.4)
D	13,415	1,913 (14.3)	302 (2.3)
E	74,561	7,167 (9.6)	1,463 (2.0)
F	74,087	8,798 (11.9)	1,416 (1.9)
G	80,256	9,862 (12.3)	1,332 (1.7)
H	55,482	8,195 (14.8)	931 (1.7)
I	100,152	12,323 (12.3)	1,669 (1.7)
J	25,978	4,374 (16.8)	418 (1.6)
K	74,306	5,456 (7.3)	1,050 (1.4)
L	30,322	4,990 (16.5)	215 (0.7)
M	98,815	11,001 (11.1)	93 (0.1)
Hospitals providing specialist paediatric services			
N	2,651	10 (0.4)	2 (0.1)
O	16,316	26 (0.2)	7 (0.0)
P	291	6 (2.1)	0 (0.0)
Q	4,843	196(4)	2 (0.0)
R	341	7 (2.1)	0 (0)
0 - <18 years : n=1,248,297			
Hospitals providing general paediatric services			
A	46,942	7,252 (15.5)	951 (2.0)
B	75,377	9,965 (13.2)	1,381 (1.8)
C	138,703	11,649 (8.4)	2,336 (1.7)
D	18,803	2,303 (12.3)	332 (1.8)
E	99,473	8,829 (8.9)	1,587 (1.6)
F	121,721	11,494 (9.4)	1,524 (1.3)
G	126,394	13,012 (10.3)	1,494 (1.2)
H	76,241	10,697 (14.0)	1,069 (1.4)
I	156,495	15,838 (10.1)	1,855 (1.2)
J	37,030	5,720 (15.5)	507 (1.4)
K	124,712	7,089 (5.7)	1,172 (0.9)
L	57,557	6,881 (12.0)	250 (0.4)
M	130,294	13,567 (10.4)	101 (0.1)
Hospitals providing specialist paediatric services			
N	5,653	26 (0.5)	2 (0.0)
O	25,378	29 (0.1)	7 (0.0)
P	416	10 (2.4)	0 (0.0)
Q	6,625	341 (5.2)	2 (0.0)
R	483	26 (5.4)	0 (0.0)

Appendix 6 – Number of rotavirus coded (CMS ICD code 008.61) admissions (n=14,570) by age in years for all admissions below 18 years (n=1,248,297) to Hospital Authority hospitals (1 July 1997 to 31 March 2011)



Appendix 7 - Number of rotavirus coded (CMS ICD code 008.61) admissions (n=14,570) by month of admission for all admissions below 18 years (n=1,248,297) to Hospital Authority hospitals (1 July 1997 to 31 March 2011) *



* Each rotavirus season in the analysis starts from 1 July of the year until 30 June of the following year except for the final 2010/11 season which is from 1 July 2010 to 31 March 2011.

Appendix 8 – Hospitalization rates of laboratory-confirmed rotavirus among children admitted to the Prince of Wales Hospital, Hong Kong (1 July 2000 to 31 March 2011)

Year	No. of admissions	No. stool specimen sent to lab	No. diagnosed rotavirus positive	Positivity rate of rotavirus from laboratory specimens (stool)	Percentage (%) of laboratory confirmed rotavirus cases as a percentage of total admissions
0 - <5 years : n=65,297					
2000/01	4686	744	225	30.2	4.8
2001/02 *	4775	890	250	28.1	5.2
2002/03 *	3512	591	200	33.8	5.7
2003/04	5291	530	127	24.0	2.4
2004/05	6290	699	132	18.9	2.1
2005/06	6604	643	109	17.0	1.7
2006/07	6147	788	147	18.7	2.4
2007/08	6534	670	136	20.3	2.1
2008/09	7346	777	226	29.1	3.1
2009/10	7847	575	75	13.0	1.0
2010/2011 ^	6265	407	83	20.4	1.3
Total	65297	7314	1710	23.4	2.6
0 - <18 years : n=100,330					
2000/01	8786	893	252	28.2	2.9
2001/02 *	8802	1032	285	27.6	3.2
2002/03 *	7366	732	235	32.1	3.2
2003/04	8331	640	141	22.0	1.7
2004/05	9415	845	152	18.0	1.6
2005/06	9776	792	123	15.5	1.3
2006/07	9243	916	160	17.5	1.7
2007/08	9426	783	159	20.3	1.7
2008/09	10001	925	261	28.2	2.6
2009/10	10829	674	89	13.2	0.8
2010/2011 ^	8355	473	97	20.5	1.2
Total	100330	8705	1954	22.5	1.9

* Active surveillance during Asian Rotavirus Surveillance Network

^ Final rotavirus season covered period 1 July 2010 to 31 March 2011 (9 months)

Appendix 9 – Length of stay and discharge status of children admitted to the Prince of Wales Hospital and to all Hospital Authority Hospitals, Hong Kong with primary diagnosis of gastroenteritis (1 July 1997 to 31 March 2011)

Diagnosis	Number of admissions	Median length of hospital stay (IQR) days	Discharge status (No. of patients)			
			Death	Home with follow up	Home without follow up	DAMA ^
All Hospital Authority hospitals						
0 - <5 years						
Gastroenteritis of presumed infectious and non-infectious diarrhoea	45,602	3 (2-4)	3 (0.0%)	12,267 (26.9%)	31,392 (68.8%)	1,793 (3.9%)
Viral gastroenteritis*	6,417	3 (3-4)	0	1,279 (19.9%)	4,894 (76.3%)	228 (3.6%)
Rotavirus diarrhoea	10,473	4 (3-5)	0	2,341 (22.4%)	7,851 (75.0%)	247 (2.4%)
Bacterial and Parasitic gastroenteritis	8,031	4 (3-6)	0	2,999 (37.3%)	4,800 (59.8%)	201 (2.5%)
Vomiting and gastritis	10,588	3 (2-3)	0	2,717 (25.7%)	7,334 (69.3%)	479 (4.5%)
ALL GE (total)	81,111	3 (2-4)	3 (0.0%)	21,603 (26.6%)	56,271 (69.4%)	2,948 (3.6%)
0 - <18 years						
Gastroenteritis of presumed infectious and non-infectious diarrhoea	56,013	3 (2-4)	4 (0.0%)	15,096 (27.0%)	38,690 (69.1%)	2,017 (3.6%)
Viral gastroenteritis*	7,494	3 (2-4)	0	1,515 (20.2%)	5,700 (76.1%)	246 (3.3%)
Rotavirus diarrhoea	11,646	4 (3-5)	0	2,569 (22.1%)	8,779 (75.4%)	264 (2.3%)
Bacterial and Parasitic gastroenteritis	9,717	4 (3-6)	0	3,578 (36.8%)	5,862 (60.3%)	232 (2.4%)
Vomiting and gastritis	19,657	3 (2-3)	1 (0.0%)	5,889 (30.0%)	13,014 (66.2%)	638 (3.3%)
ALL GE (total)	104,527	3 (2-4)	5 (0.0%)	28,647 (27.4%)	72,045 (68.9%)	3397 (3.3%)
Prince of Wales Hospital						
0 - <5 years						
Gastroenteritis of presumed infectious and non-infectious diarrhoea	4,808	3 (2-4)	0	708 (14.7%)	3,920 (81.5%)	174 (3.6%)
Viral gastroenteritis*	1,026	3 (2-4)	0	114 (11.1%)	882 (86.0%)	30 (2.9%)
Rotavirus diarrhoea	1,119	4 (3-6)	0	151 (13.5%)	955 (85.3%)	12 (1.1%)
Bacterial and Parasitic gastroenteritis	598	5 (3-8)	0	162 (27.1%)	428 (71.6%)	8 (1.3%)
Vomiting and gastritis	1,355	3 (2-4)	0	282 (20.8%)	1,012 (74.7%)	61 (4.5%)
ALL GE (total)	8,906	3 (2-5)	0	1,417 (15.9%)	7,197 (80.8%)	285 (3.2%)
0 - <18 years						
Gastroenteritis of presumed infectious and non-infectious diarrhoea	5,999	3 (2-4)	1 (0.0%)	951 (15.9%)	4,849 (80.8%)	191 (3.2%)
Viral gastroenteritis*	1,283	3 (2-4)	0	147 (11.5%)	1,101 (85.8%)	35 (2.7%)
Rotavirus diarrhoea	1,252	4 (3-6)	0	165 (13.2%)	1,073 (85.7%)	13 (1.0%)
Bacterial and Parasitic gastroenteritis	717	5 (3-8)	0	188 (26.2%)	520 (72.5%)	9 (1.3%)
Vomiting and gastritis	2,496	3 (2-4)	1 (0.0%)	570 (22.8%)	1,850 (74.1%)	75 (3.0%)
ALL GE (total)	11,747	3 (2-4)	2 (0.0%)	2,021 (17.2%)	9,393 (80.0%)	323 (2.8%)

*Excludes rotavirus

^Discharge with acknowledgement to medical advice