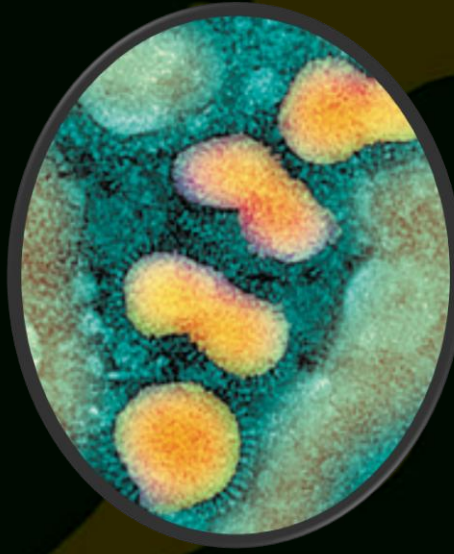




Human Influenza A(H5N1) virus of Avian/Animal Origins



By
Michael Fraser RN



Timeline of Emergence of Some Influenza Viruses in Humans

(Asiatic) Russian Influenza

B Russian Flu (H2N2) 1889/1890 1 million

1900 Old Hong Kong Influenza H3N8?

Old Hong Kong Influenza

Spanish Influenza

1918 (Spanish Flu) (H1N1) 20-40 million deaths

H3

Hong Kong Influenza

H2

1957 (Asian Flu) 1-4 million deaths H2N2

Asian Influenza

H7

Russian Flu (H1N1)A/USSR/90/77 approx 1 million

Quadruple Reassortment Result

2009 Hybrid "quadruple reassortant" Noval Pandemic Influenza A(H1N1) 09 Virus —a human virus, an avian virus, and 2 porcine viruses

"Pandemic (H1N1) 2009"

H1

Pandemic A(H1N1)v 2009 Virus 18,499+ Deaths

Avian Influenza

H5

1997: In Hong Kong, A/H5N1 18 (6 deaths)
2003 Avian influenza A(H5N1) 381Deaths of 644 cases

H9

1997-2009:Avian influenza A(H9N2)

1980- 2003: Avian influenza A(H7N7)



Pandemic vaccines

Seasonal vaccines

1918

1957

1968

1977

1993

1997

1998-9

2003

2009

2010

2012

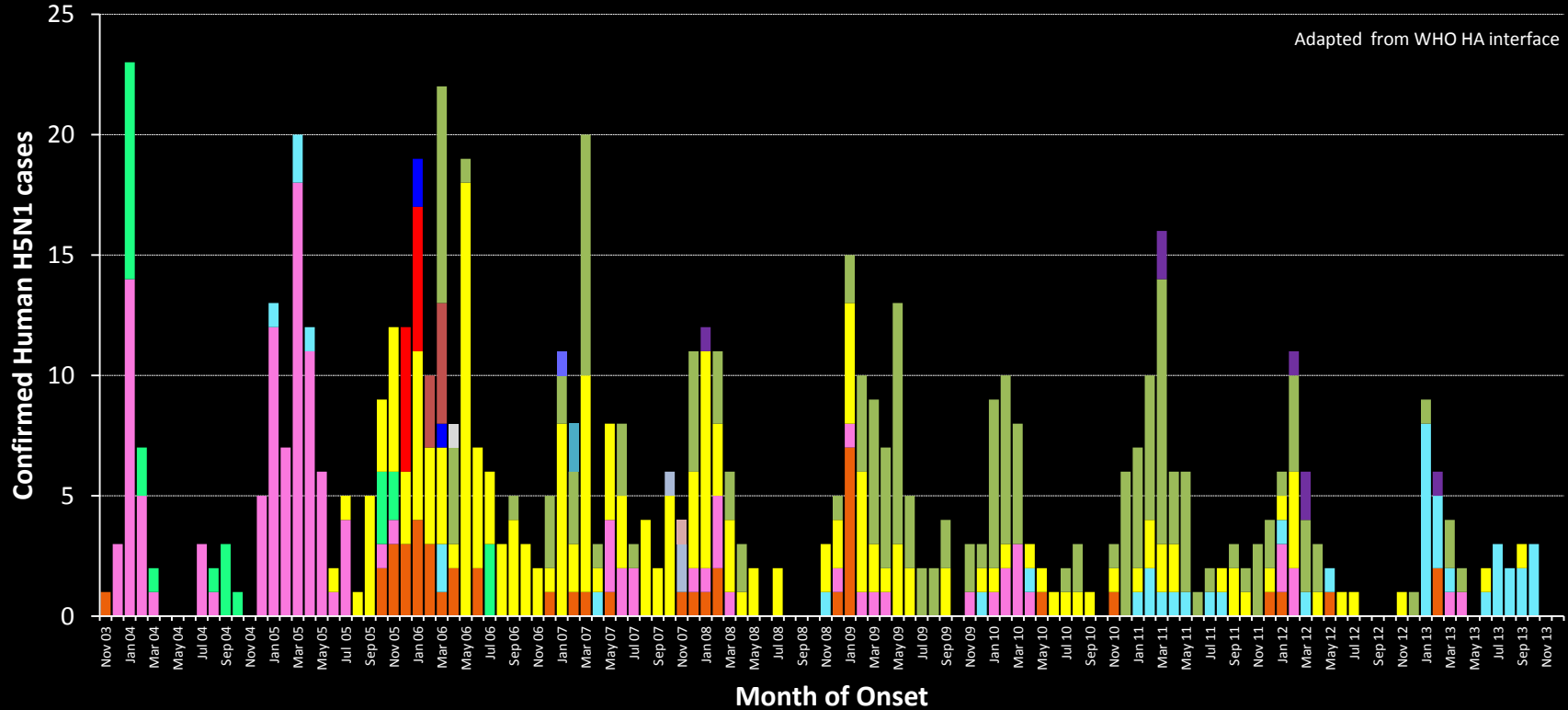
11/8/2013

US 1976 Swine Influenza

By 1993, a bird flu virus had adapted to pigs, grabbed a few human flu virus genes, and infected two young Dutch children, even displaying evidence of limited human-to-human transmission.



Human Avian influenza A(H5N1) Cases by Onset Month and Country (n=644)

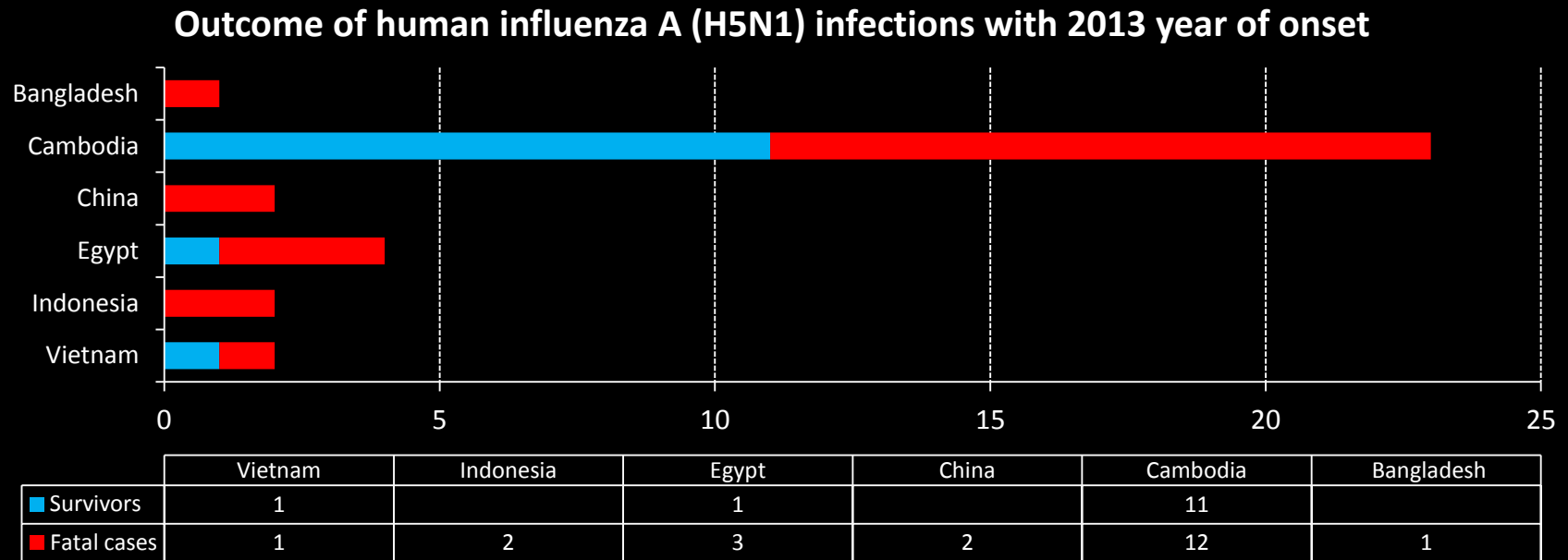


■ Bangladesh (n=7)	■ Myanmar (n=1)	■ Pakistan (n=3)	■ Nigeria (n=1)	■ Lao PDR (n=2)
■ Djibouti (n=1)	■ Egypt (n=173)	■ Azerbaijan (n=8)	■ Iraq (n=3)	■ Turkey (N=12)
■ Indonesia (n=194)	■ Cambodia (n=44)	■ Thailand (n=25)	■ Vietnam (n=125)	■ China (n=45)



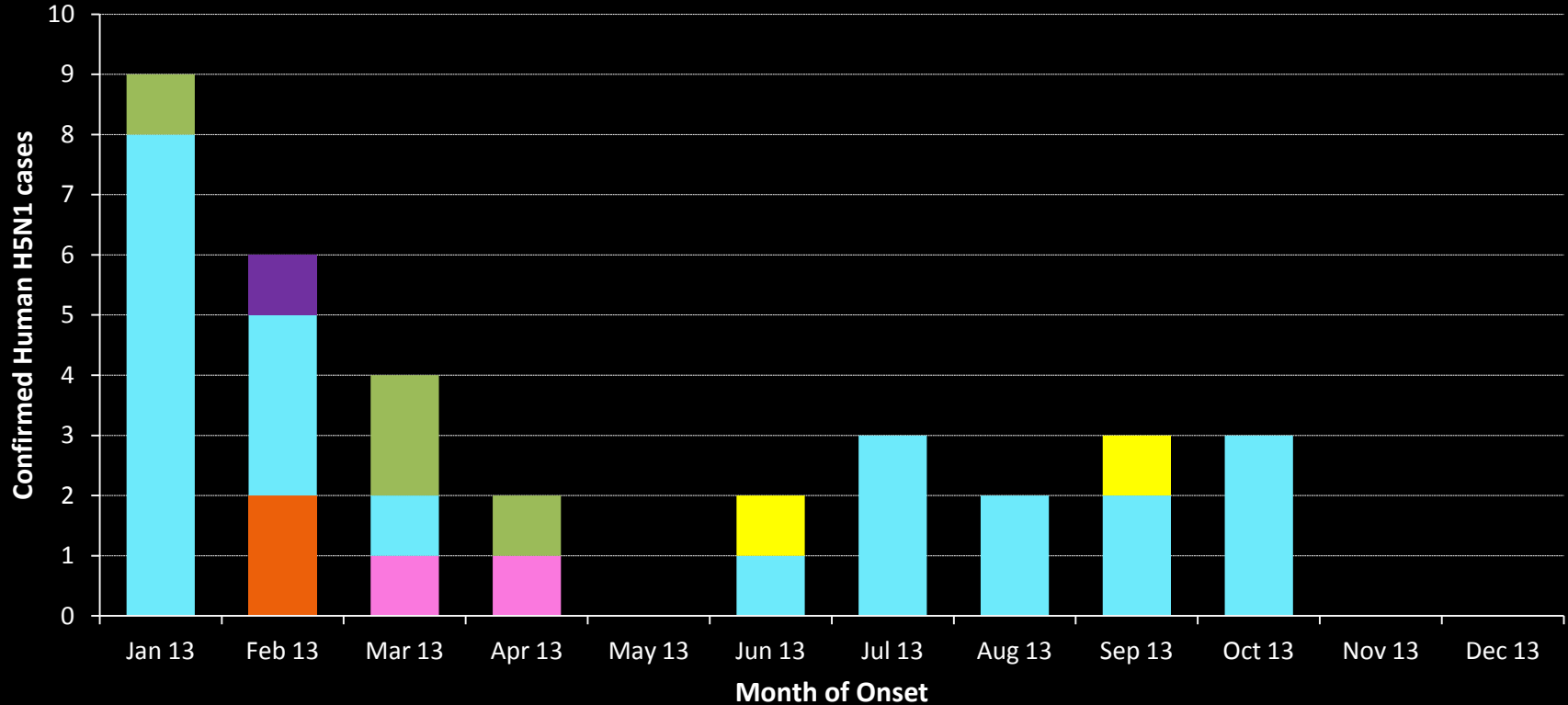
Interim Outcome of human influenza A (H5N1) infections with 2013 year of onset

Interim number of confirmed cases (n=34) 21 deaths (CFR=59.09)





Human Avian influenza A(H5N1) Cases by Onset Month and Country (n=34)



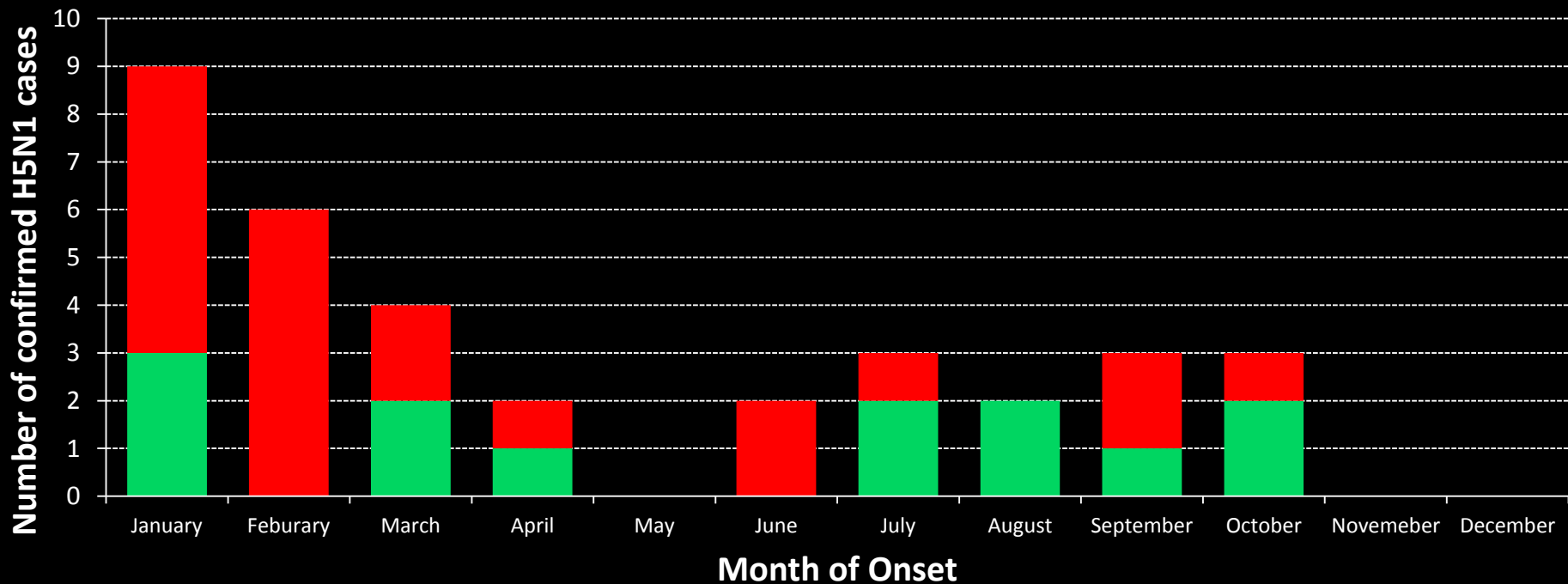
■ Bangladesh (n=1) ■ Egypt (n=4) ■ Indonesia (n=2) ■ Cambodia (n=23) ■ Vietnam (n=2) ■ China (n=2)



2013 Human Influenza A(H5N1) Cases by Month of Onset

Interim Distribution of Human H5N1 Confirmed Survivors and Deaths by Month of Onset (n=34)

■ Survivors (n=13) ■ Deaths (n=21)





2013 Human Influenza A(H5N1) Cases

Interim Distribution of 2013 Human Influenza A/H5N1 Confirmed Cases and Deaths by Sex, Age and Outcome (n=34)

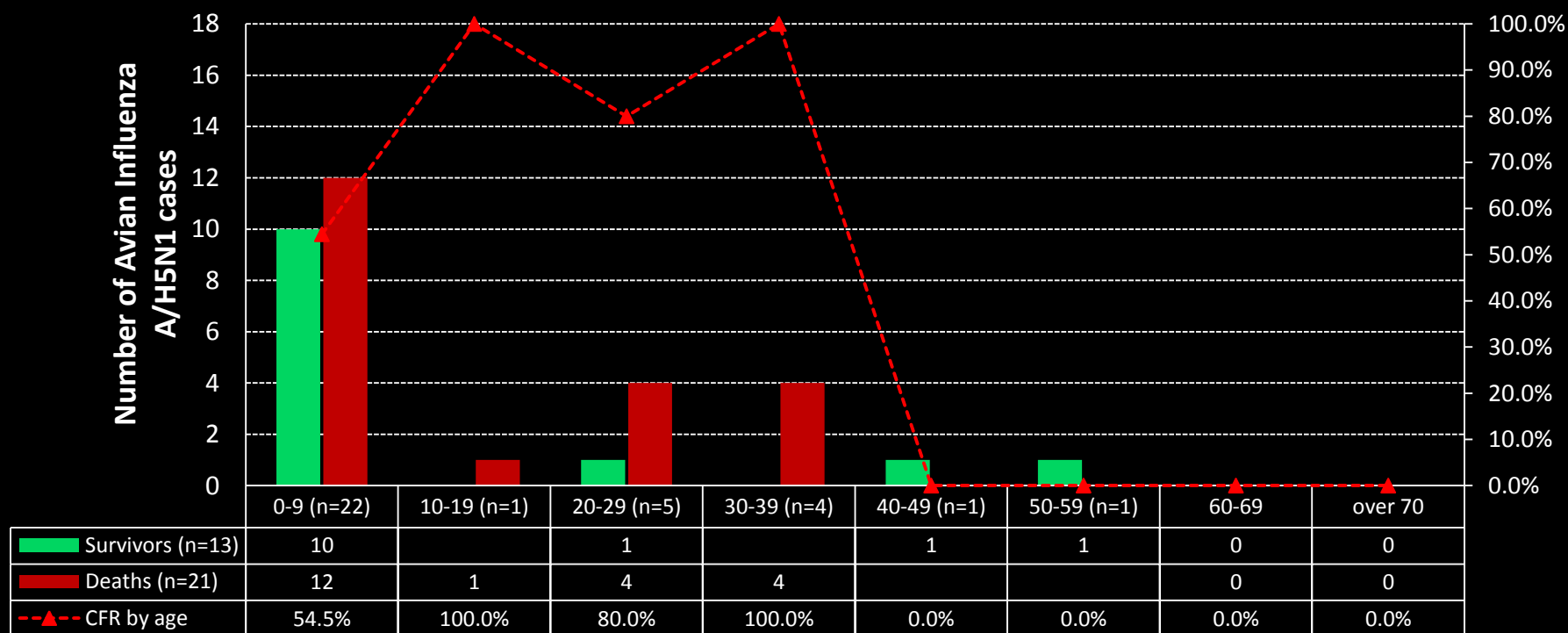
Age groups	Male	Female	Male survivors	Male deaths	Female survivors	Female deaths	Total	Survivors	Deaths	CFR
0-9 (n=22)	10	12	6	4	4	8	22	10	12	54.45%
10-19 (n=1)	0	1	0	0	0	1	1	0	1	100%
20-29 (n=5)	2	3	0	2	1	2	5	1	4	80.0%
30-39 (n=4)	3	1	0	3	0	1	4	0	4	100%
40-49 (n=1)	0	1	0	0	1	0	1	1	0	0.0%
50-59 (n=1)	1	0	1	0	0	0	1	1	0	0.0%
60-69 (n=0)										0.0%
≥70 (n=0)										0.0%
Total	16	18	7	9	6	12	34	13	21	61.76%
n=34	n=34		n=16		n=18		n=34	34 (100%)		n/a

Source –WHO Avian Influenza [Situation update archives](#) 2013
5 (F) in August from Kendal pending outcome- critical condition!



2013 Human Influenza A(H5N1) Cases

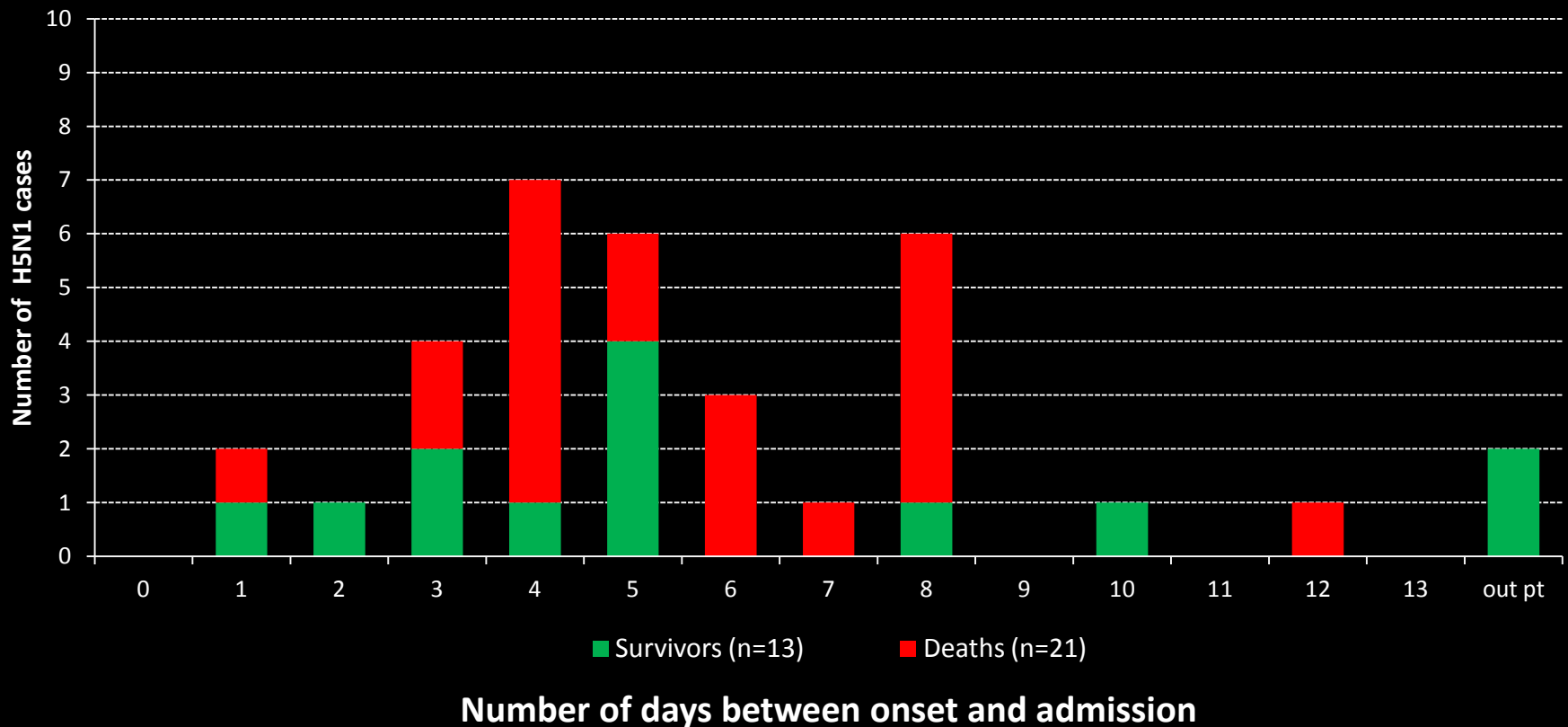
Interim Distribution of H5N1 Survivors and Deaths by age group
[Data as of 4th , November, 2013 (n=34)]





2013 Human Influenza A(H5N1) Cases

Interim Human Influenza H5N1 Cases Number of days between onset and hospitalisations (n=34)





Interim Cambodia Avian Influenza H5N1 Confirmed Cases from 2005-2013 (n=44)





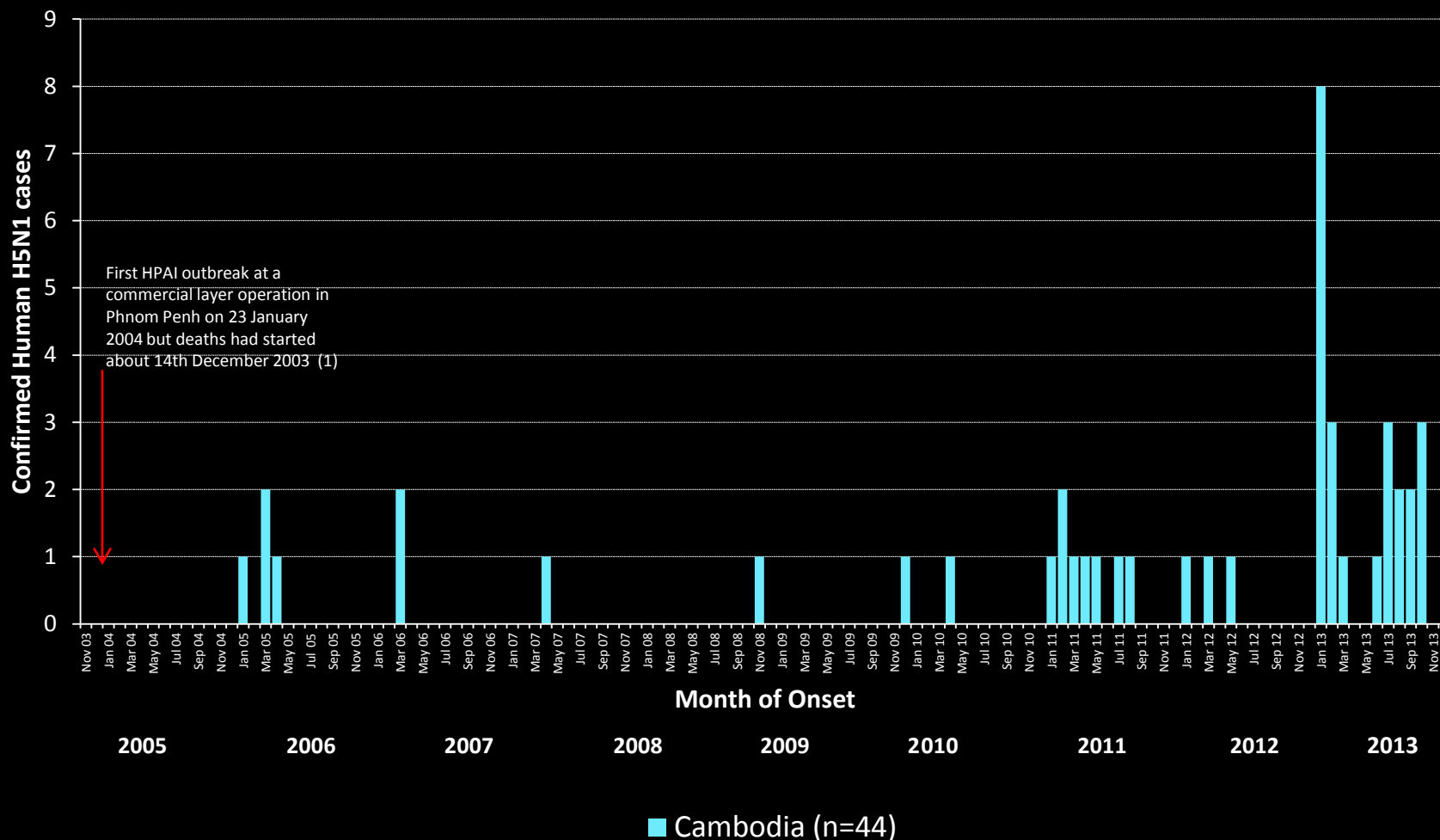
Cambodia Avian Influenza H5N1 Line List

2005-2013 (n=44)

Case #	Age	Sex	Province (sub list)	District (sub list)	Onset	Admission	Antiviral	Outcome	Exposure
Suspect	14 ^a	Male	Kampot (0)	Kampot Trach	Mid Jan	No data	No data	Fatal 24-Jan	Father's chickens died ^c
1	25 ^a	Female (1)	Kampot (1)	Kampot Trach (1)	21-Jan-05	28-Jan-05 ^b	No data	Fatal 30-Jan-05	Father's chickens died ; slaughtered fowls for meal 2 weeks before onset ^c
2	28	Male (1)	Kampot (2)	Bantey Meas (1)	17-Mar-05	21-Mar-05	No data	Fatal 22-Mar-05	Direct contact with dead chickens 1 week before onset , defeathering and consumed ^d
3	8	Female (2)	Kampot (3)	Bantey Meas (2)	29-Mar-05	7-Apr-05	No data	Fatal 7-Apr-05	Had contact with died poultry but not within 2 weeks of onset
4	20	Female (3)	Kampot (4)	Kampot Trach (2)	No data	19-Apr-05 ^e	No data	Fatal 19-Apr-05	Part time poultry vendor at school
5	3	Female (4)	Kampong Speu (1)	Kong Pisey (1)	14-Mar-06	20-Mar-06	No Data	Fatal 21-Mar-06	known to play with sick and dead poultry 1 week prior to onset
6	12	Male (2)	Prey Veng (1)	Mesang (1)	29-Mar-06	4-Apr-06	No data	Fatal 5-Apr-06	Known to have collected sick and dead chickens around house
7	13	Female (5)	Kampong Cham (1)	Ponhea Kreak (1)	2-Apr-07	3-Apr-07	No Data	Fatal 5-Apr-07	consumed sick chicken prior to onset (backyard poultry (chickens and ducks) in one village (5 households) ¹
8	19	Male (3)	Kandal (1)	<u>Tunsay Keuch village</u> , Kandal Steung (1)	28-Nov-08	2-Dec-08* (WPRO) or 3- Dec-13 (NCDM)	No Data	Recovered	consumed sick chicken prior to onset (backyard poultry (chickens and ducks) in one village (5 households) ¹ ; 16-Nov-08 reported to have received a dead chicken from a military camp in Kandal Strung district returned to Kampong Speu and developed symptoms on 28-Nov-08 and returned to Tunsay Keuch village, sample taken at NAMRU-2 FSS; private clinic in , Admitted to TB centre 3-Dec-10, referred to Calmette 11-Dec-08 (NCDM Mar-09)
9	57	Male (4)	Kampong Cham (2)	Ponhea Kreak (2)	11-Dec-09	16-Dec-09	No Data	Recovered	Backyard poultry including chickens and ducks (1,012 chickens and 204 ducks). 875 birds corresponding to 751 chickens and 124 ducks were culled. La-ak, Ponhea Kreak
10	27	Male (5)	Prey Veng (2)	Kampong Leav (1)	13-Apr-10	16-Apr-10	No Data	Fatal 17-Apr-10	prepared and consumed sick poultry in the 7 days before onset of symptoms.
11	5	Female (6)	Phnom Penh (1)	Reussey Keo (1)	30-Jan-11	3-Feb-11	4-Feb-11	Fatal 4-Feb-11	contact with sick poultry during the 7 days before onset of symptoms
12	19	Female (7)	From Banteay Meanchey (1) [Prey	Malay (1)	5-Feb-11	12-Feb-11	No data	Fatal 12-Feb-11	Mother was exposed to eating and preparing sick poultry while visiting relatives in Prash Sdach district, Prey



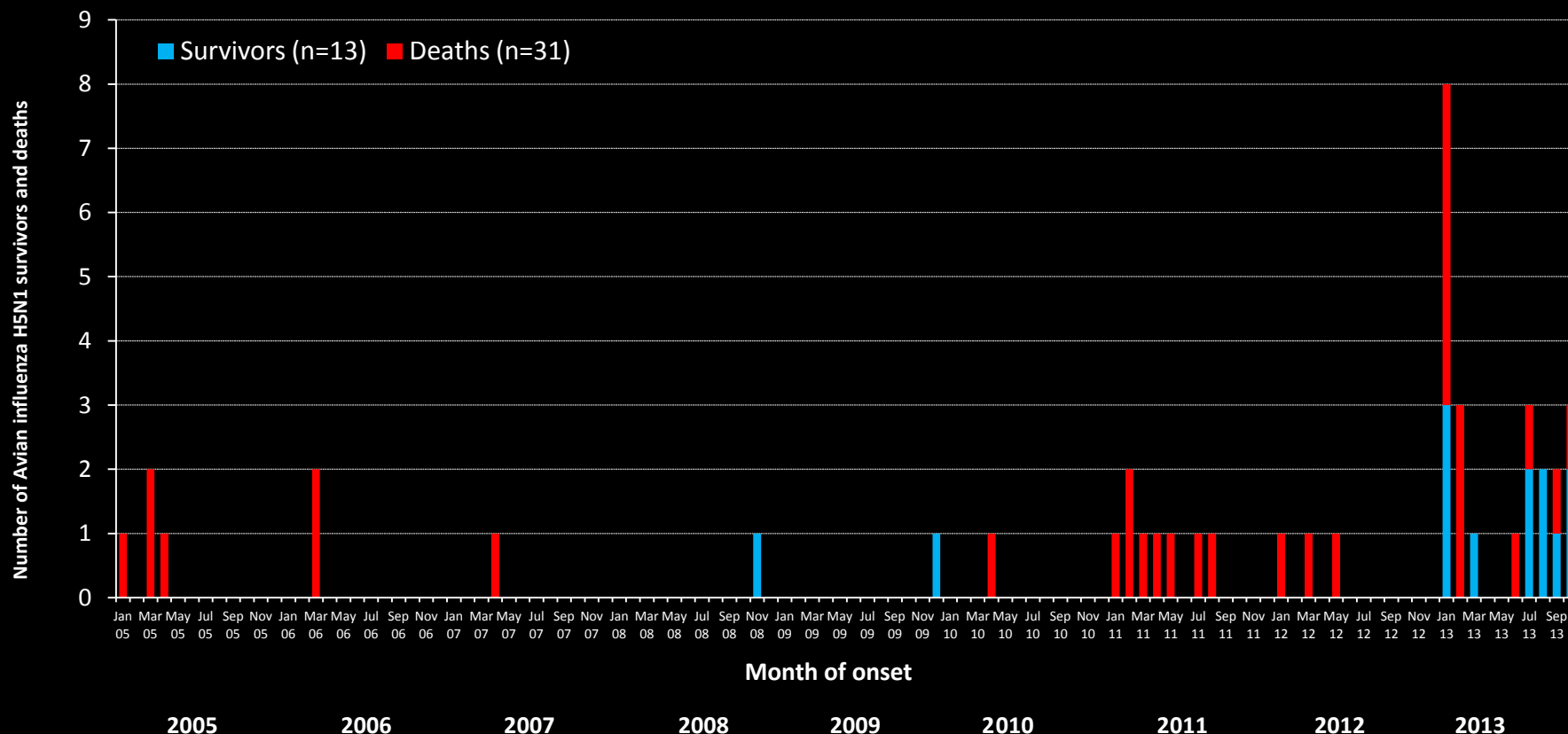
Human Avian influenza A(H5N1) Cases by Month of Onset in Cambodia (n=44)





Avian Influenza H5N1 in Cambodia 2005-2013

**Epidemiological curve of Human Avian Influenza A(H5N1)
confirmed cases in Cambodia by month of onset (n=44)**

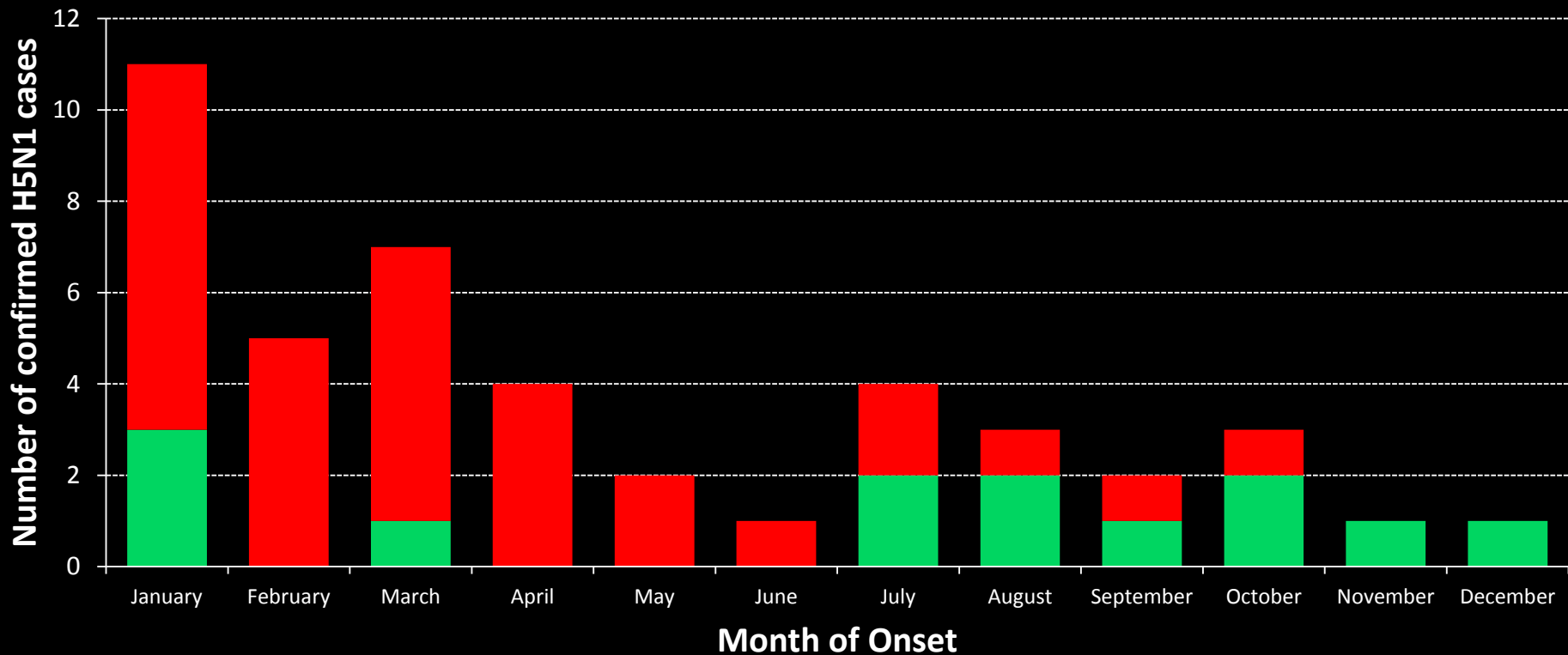




2005-2013 Human Influenza A(H5N1) Cases by Month of Onset in Cambodia

Distribution of Human H5N1 Confirmed Survivors and Deaths by Month of Onset from 2005-2013 (n=44)

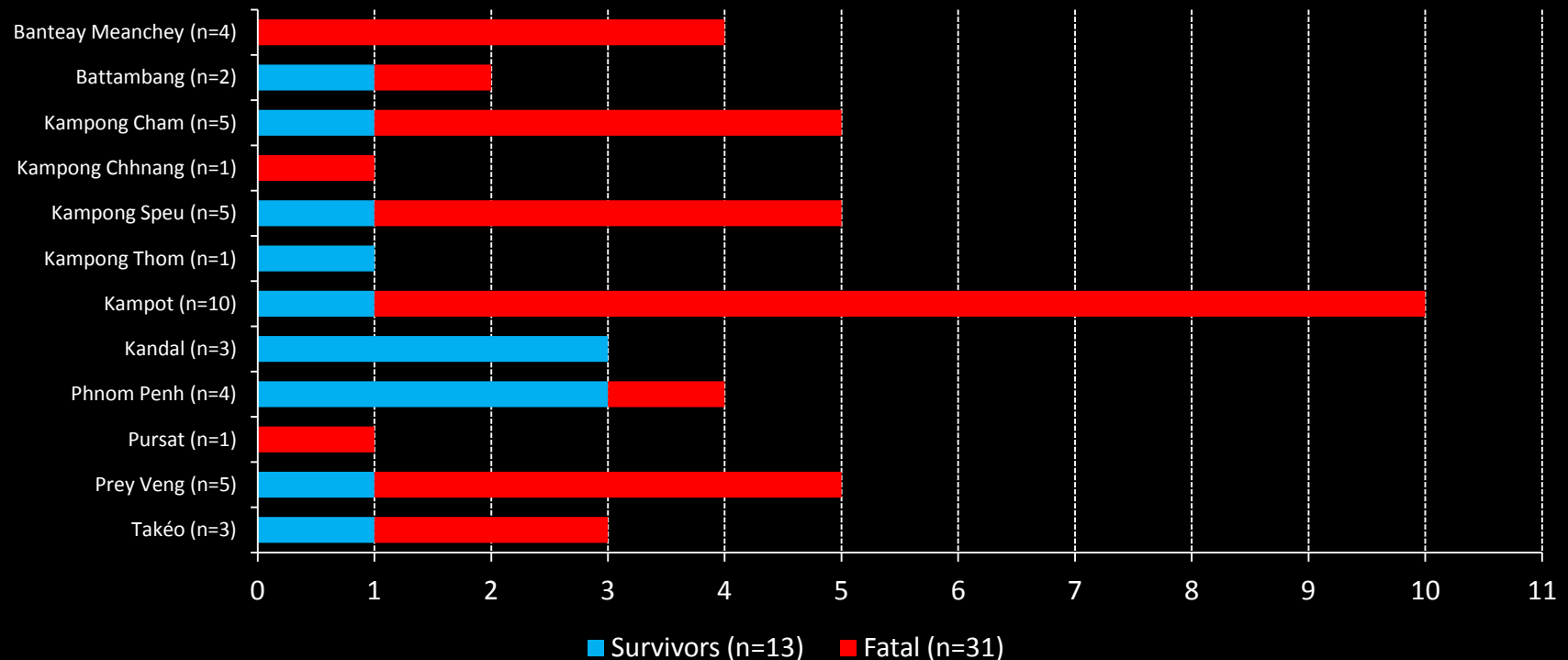
■ Survivors (n=13) ■ Deaths (n=31)





Human Avian influenza A(H5N1) in Cambodia by Provinces and Outcome

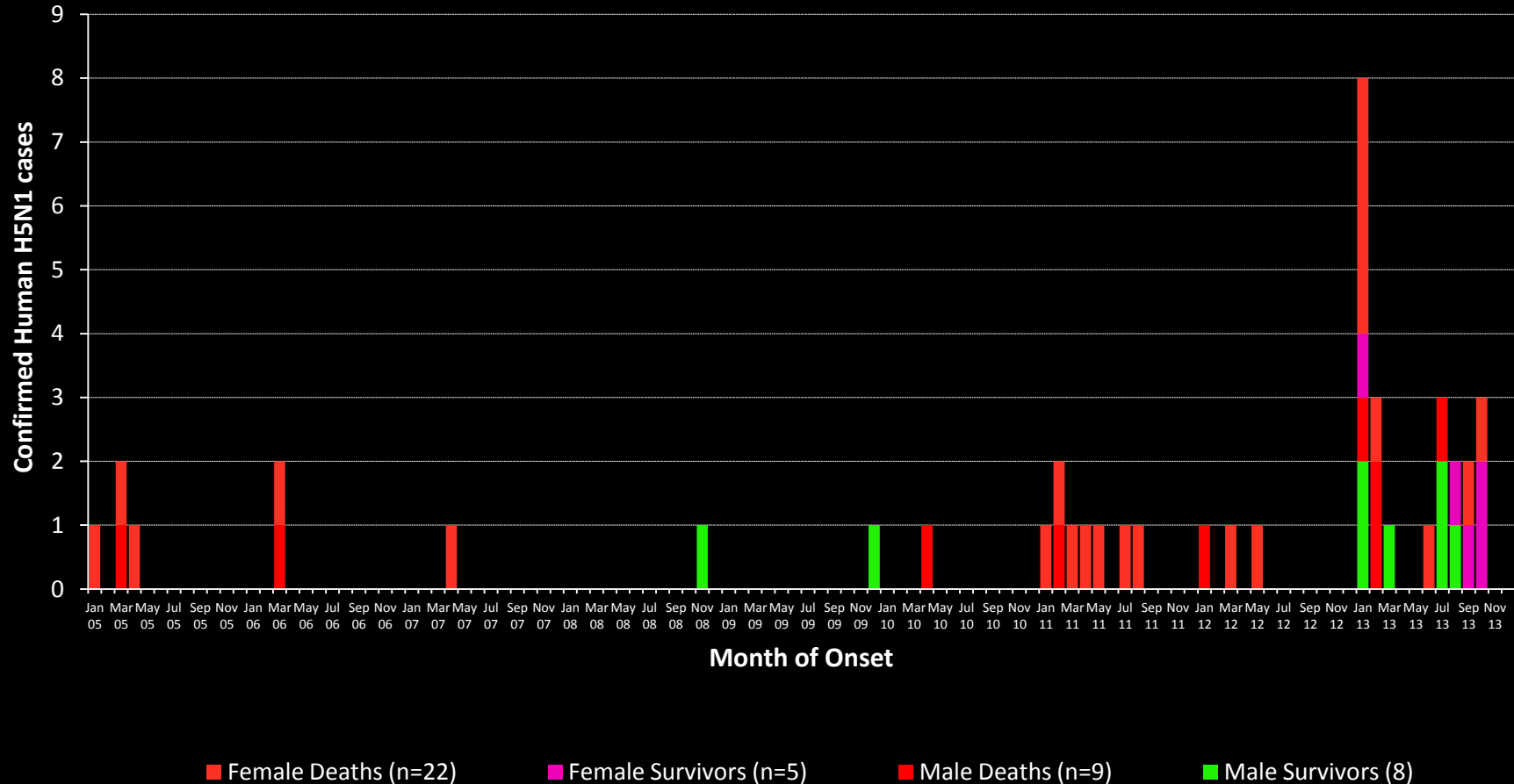
Interim Human Avian influenza A(H5N1) by
Cambodian Provinces and Outcome (n=44) 31 deaths (CFR=70.45%)



Note: 2 fatal cases from Banteay Meanchey province acquired infection in Prash Sdach, Prey Veng respectively!



Human Avian influenza A(H5N1) Cases by Onset Month, Sex and Outcome (n=44)





Cambodia Avian Influenza H5N1 Confirmed Cases by Sex, Age and Outcome (n=44) 2005-2013

Cambodia Avian Influenza H5N1 Confirmed Cases and Deaths by Sex, Age and Outcome (n=44) 2005-2013										
Age Groups	Male	Female	Male survivors	Male deaths	Female survivors	Female deaths	Total Cases	Survivors	Deaths	CFR
0-9 (n=29)	9	20	5	4	5	15	29	10	19	65.52%
10-19 (n=7)	2	5	1	1	0	5	7	1	6	85.71%
20-29 (n=4)	2	2	0	2	0	2	4	0	4	100.00%
30-39 (n=2)	2	0	0	2	0	0	2	0	2	100.00%
40-49 (n=0)										0.00%
50-59 (n=2)	2	0	2	0	0	0	2	2	0	0.00%
60-69 (n=0)										0.00%
≥70 (n=0)										0.00%
Total	17	27	8	9	5	22	44	13	31	70.45%
n= 44	n=43		M= 17		F= 27		n= 44	100% of cases		n/a

Comparison of CFR's in Cambodia from 2005-2012 and 2005-2013

Cambodia Avian Influenza H5N1 Confirmed Cases and Deaths by Sex, Age and Outcome From 2005-2012 (n=21)										
Indicators	Male	Female	Male survivors	Male deaths	Female survivors	Female deaths	Total Cases	Survivors	Deaths	CFR%
Total	7	14	2	5	0	14	21	2	19	n/a
Cumulative total	21		Male-CFR- 71.42%		Female CFR- 100%		21	2	19	90.00%

Cambodia Avian Influenza H5N1 Confirmed Cases and Deaths by Sex, Age and Outcome from 2005-2013 (n=44)										
Indicators	Male	Female	Male survivors	Male deaths	Female survivors	Female deaths	Total Cases	Survivors	Deaths	CFR%
Total	17	27	8	9	5	22	44	13	31	n/a
Cumulative total	44		Male-CFR- 52.94%		Female CFR- 81.48%		44	13	31	70.45%



Interim Cambodia Avian Influenza H5N1 Confirmed Cases by Sex, Age and Outcome (n=23) 2013

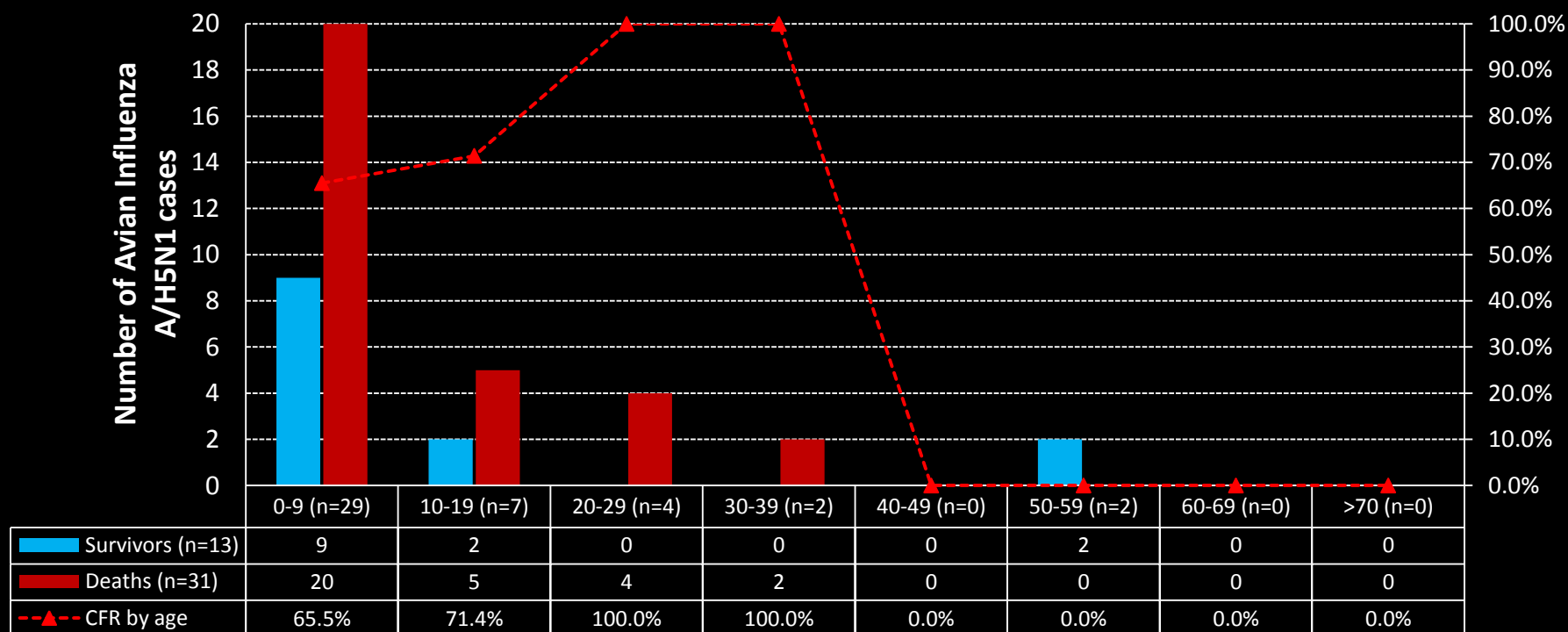
Interim Cambodia Avian Influenza H5N1 Confirmed Cases and Deaths by Sex , Age and Outcome (n=23) 2013										
Interim 2013 Age Groups	Male	Female	Male survivors	Male deaths	Female survivors	Female deaths	Total Cases	Survivors	Deaths	CFR
0-9 (n=19)	7	12	5	2	5	7	19	10	9	47.37%
10-19 (n=1)		1				1	1	0	1	100.00%
20-29 (n=0)										0.00%
30-39 (n=2)	2			2			2	0	2	100.00%
40-49 (n=0)							0	0	0	0.00%
50-59 (n=1)	1		1				1	1	0	0.00%
60-69 (n=0)							0	0	0	0.00%
≥70 (n=0)							0	0	0	0.00%
Total	10	13	6	4	5	8	23	11	13	56.52%
n= 23	n= 23		M= 10		F= 13		n= 23	100%		n/a

Cambodia Avian Influenza H5N1 Confirmed Cases and Deaths by Sex , Age and Outcome 2005-2013 (n=44)										
Indicators	Male	Female	Male survivors	Male deaths	Female Survivors	Female deaths	Total Cases	Survivors	Deaths	CFR%
Total	17	27	8	9	5	22	44	13	31	n/a
Cumulative total	44		Male-CFR- 52.94%		Female CFR- 81.48%		44	13	31	70.45%



2013 Human Influenza A(H5N1) Cases

Interim Distribution of H5N1 Survivors and Deaths by age group in Cambodia [Data as of 4th, November, 2013 [n=44 (31)]]





Cambodia Avian Influenza H5N1 Line List

2005-2013 (n=44)

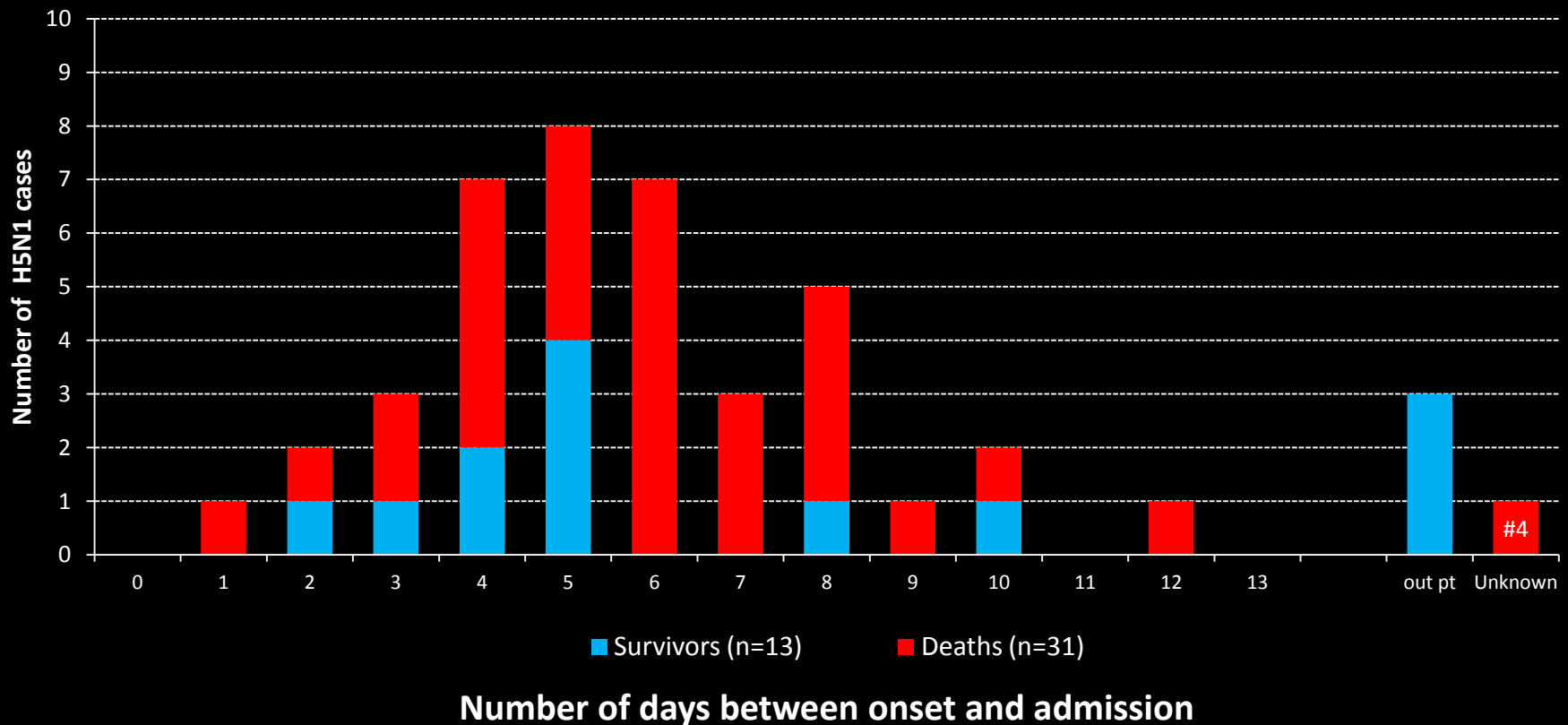
Case #	Age	Sex	Province	Onset	Admission	1 st medical contact	2 nd medical contact	Days between onset and hospitalisation	Outcome	Date of outcome	Days between onset and death	Days between hospitalisation and death
Suspect	14 ^a	Male	Kampot	Mid Jan 2005	Died at home	local practitioner	N/A	N/A	Fatal	24-Jan-05	N/A	N/A
1	25 ^a	Female (1)	Kampot	21-Jan-05	27/28-Jan-05 ^b	local clinic in Kampot	Kien Giang Provincial Hospital, Vietnam	6	Fatal	30-Jan-05	9	3
2	28	Male (1)	Kampot	17-Mar-05	21-Mar-05	in a Phnom Penh hospital	N/A	4	Fatal	22-Mar-05	5	1
3	8	Female (2)	Kampot	29-Mar-05	7-Apr-05	district referral hospital in Kampot	Kantha Bopha Children's Hospital, Phnom Penh	9	Fatal	7-Apr-05	9	0
4	20	Female (3)	Kampot	No data	19-Apr-05 ^e	Vietnamese hospital in Kien Giang, Vietnam	N/A	ukn	Fatal	19-Apr-05	ukn	ukn
5	3	Female (4)	Kampong Speu	14-Mar-06	20-Mar-06	Kantha Bopha Children's Hospital, Phnom Penh	N/A	6	Fatal	21-Mar-06	7	1
6	12	Male (2)	Prey Veng	29-Mar-06	4-Apr-06	1-Apr-06 brought to Phnom Penh for Tx	Calmette Hospital	6	Fatal	5-Apr-06	7	1
7	13	Female (5)	Kampong Cham	2-Apr-07	3-Apr-07	A Phnom Penh hospital (? Calmette)	N/A	1	Fatal	5-Apr-07	3	2
8	19	Male (3)	Kandal	28-Nov-08	3-Dec-08	30-Nov-08 and again 2-Dec-08 visited local health centre (enrolled in FSS)	WPRO- admitted 2-Dec-08; 11-Dec-08 currently being treated at Calmette hospital, Phnom Penh	5	Recovered	No data	N/A	N/A
9	57	Male (4)	Kampong Cham	11-Dec-09	16-Dec-09	<u>13-Dec-09</u> symptoms identified by Local Influenza ILI Research Study	16-Dec-13 Kampong Cham Provincial Hospital	5	Recovered	No data	N/A	N/A
10	27	Male (5)	Prey Veng	13-Apr-10	16-Apr-10	local hospital in Prey Veng	17-Apr-05 Calmette Hospital, Phnom Penh ICU	3	Fatal	17-Apr-10	4	1



2005-2013 Human Influenza A(H5N1)

Cases in Cambodia

Interim Cambodian Human Influenza H5N1 Cases
Number of days between onset and hospitalisations (n=44)





The End

Pending further slides r/t interim
2013