Seasonal influenza and its impact on public health practice in New Zealand

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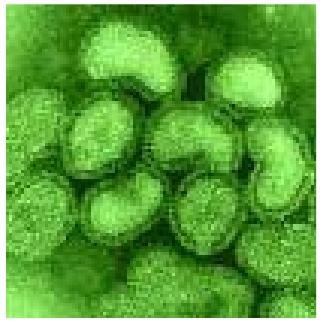
Specialist Science Solutions

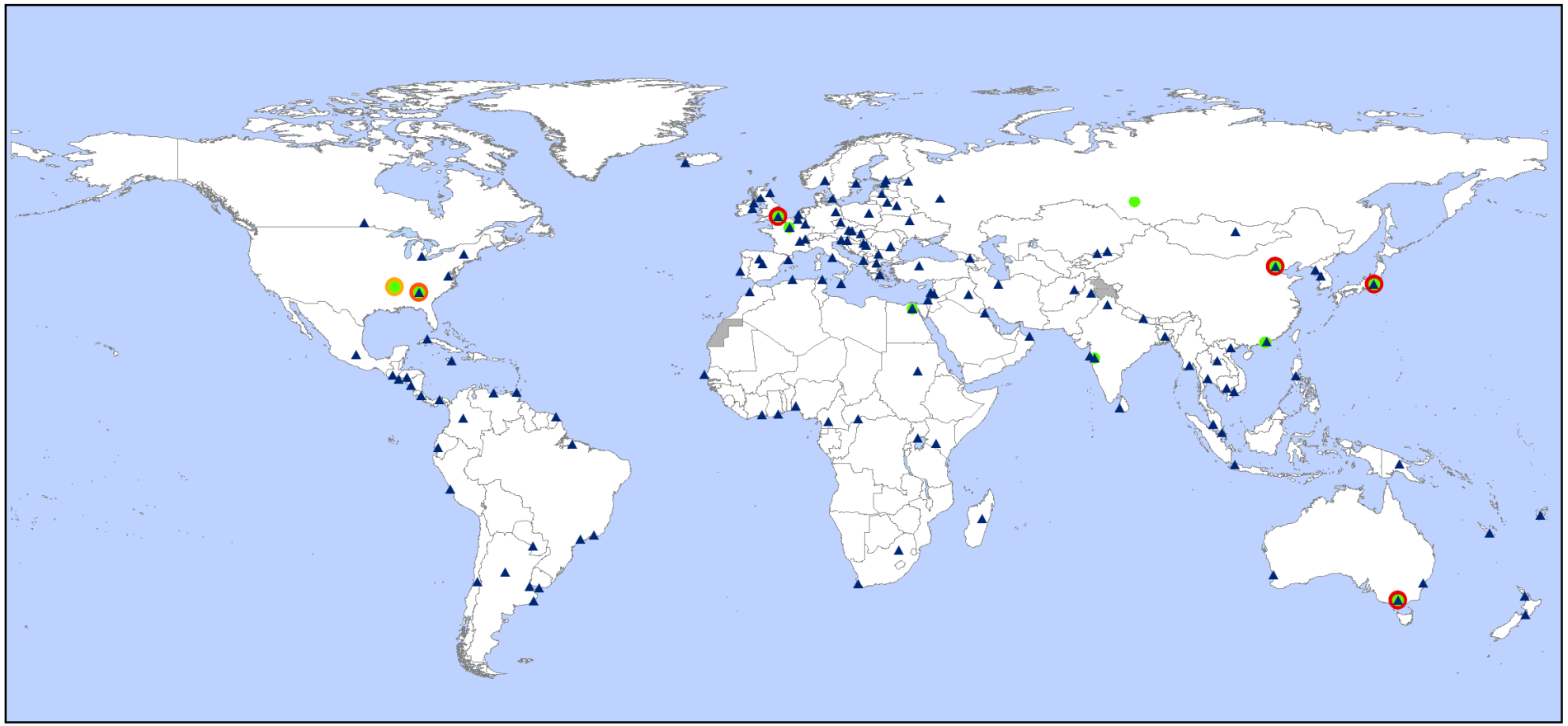
Manaaki Tangata Taiao Hoki
protecting people and their environment through science

Outline



- Background on seasonal influenza in NZ
- Impact of disease burden on vaccination policy
- Impact of oseltamivir-resistant viruses on antiviral intervention
- Impact of surveillance infrastructure on pandemic response
  - border control (case isolation & quarantine)
- Future direction of the seasonal influenza study

WHO Global Influenza Surveillance and Response System (GISRS)



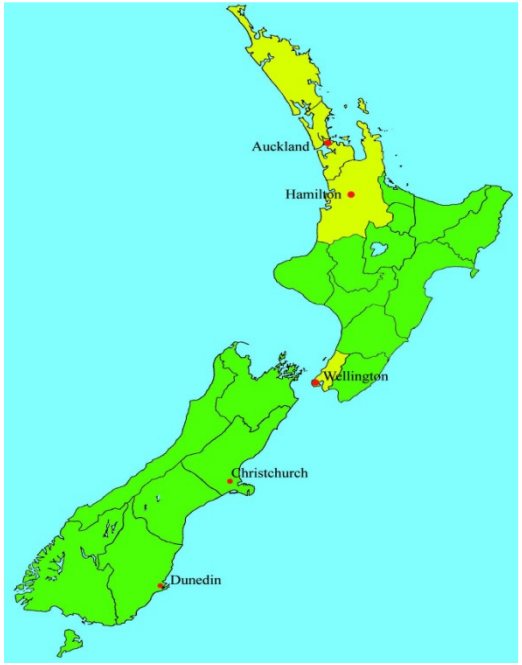
24 May 2011

- National Influenza Centres
- WHO Collaborating Centres for Reference and Research on Influenza
- WHO Collaborating Centre for the Surveillance, Epidemiology and Control of Influenza
- WHO Collaborating Centre for Studies on the Ecology of Influenza in Animals
- H5 Reference Laboratories

World Health Organization

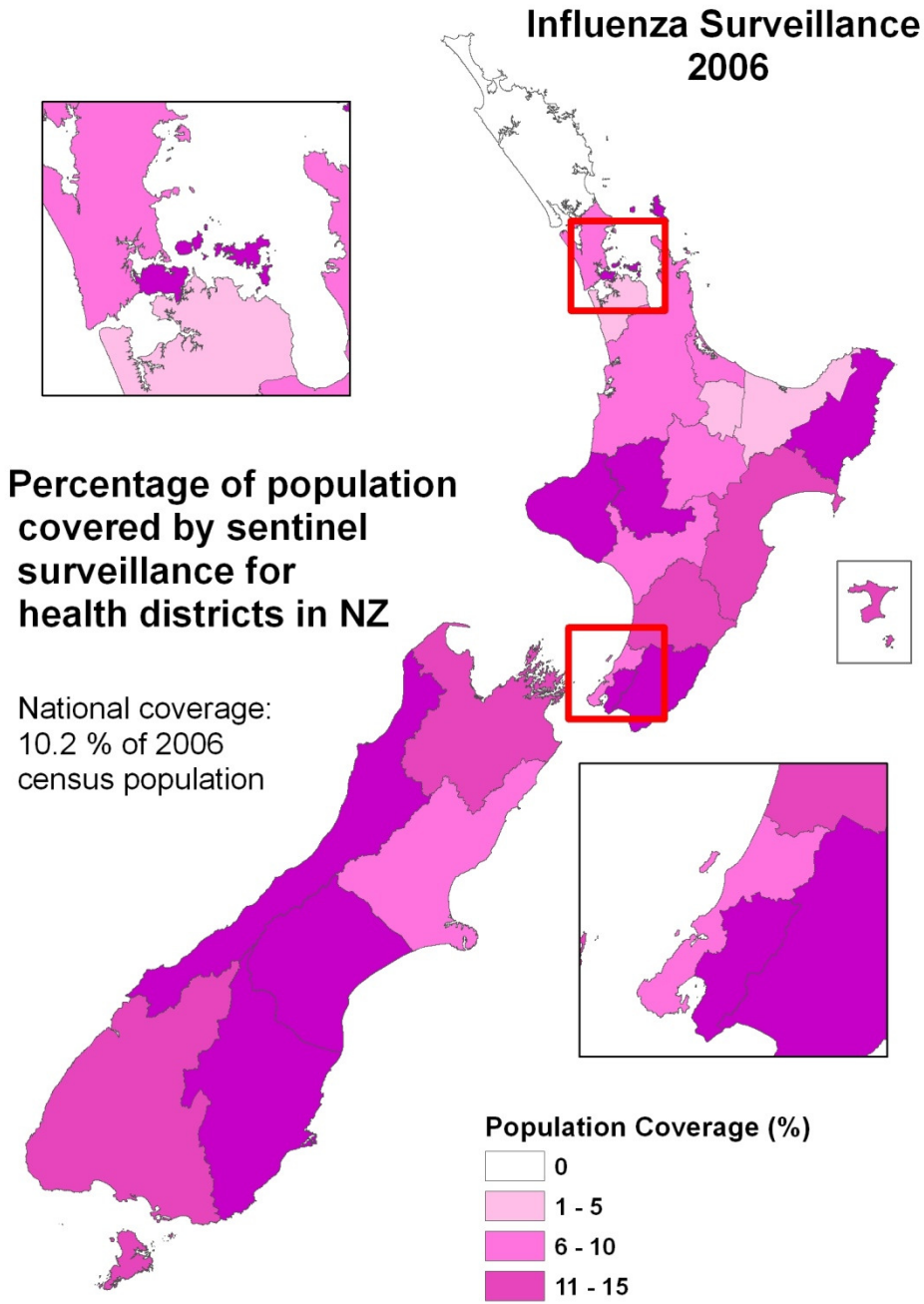
Data Source: GISRS, WHO
Map Production:
Global Influenza Programme
World Health Organization

National Influenza Surveillance in New Zealand

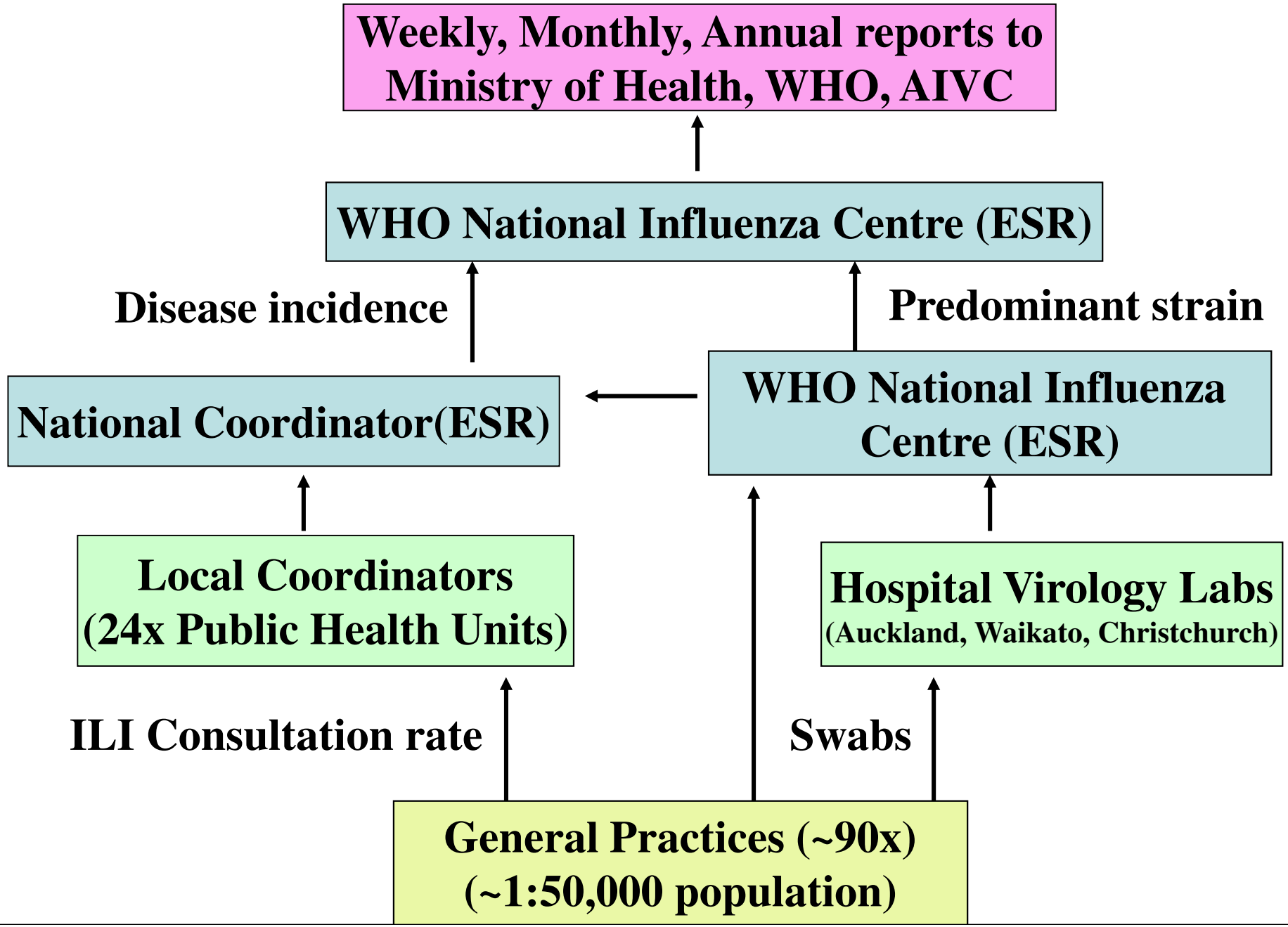


- **Disease Surveillance**
  - describe incidence and distribution of influenza
  - detect influenza epidemics to assist public health intervention

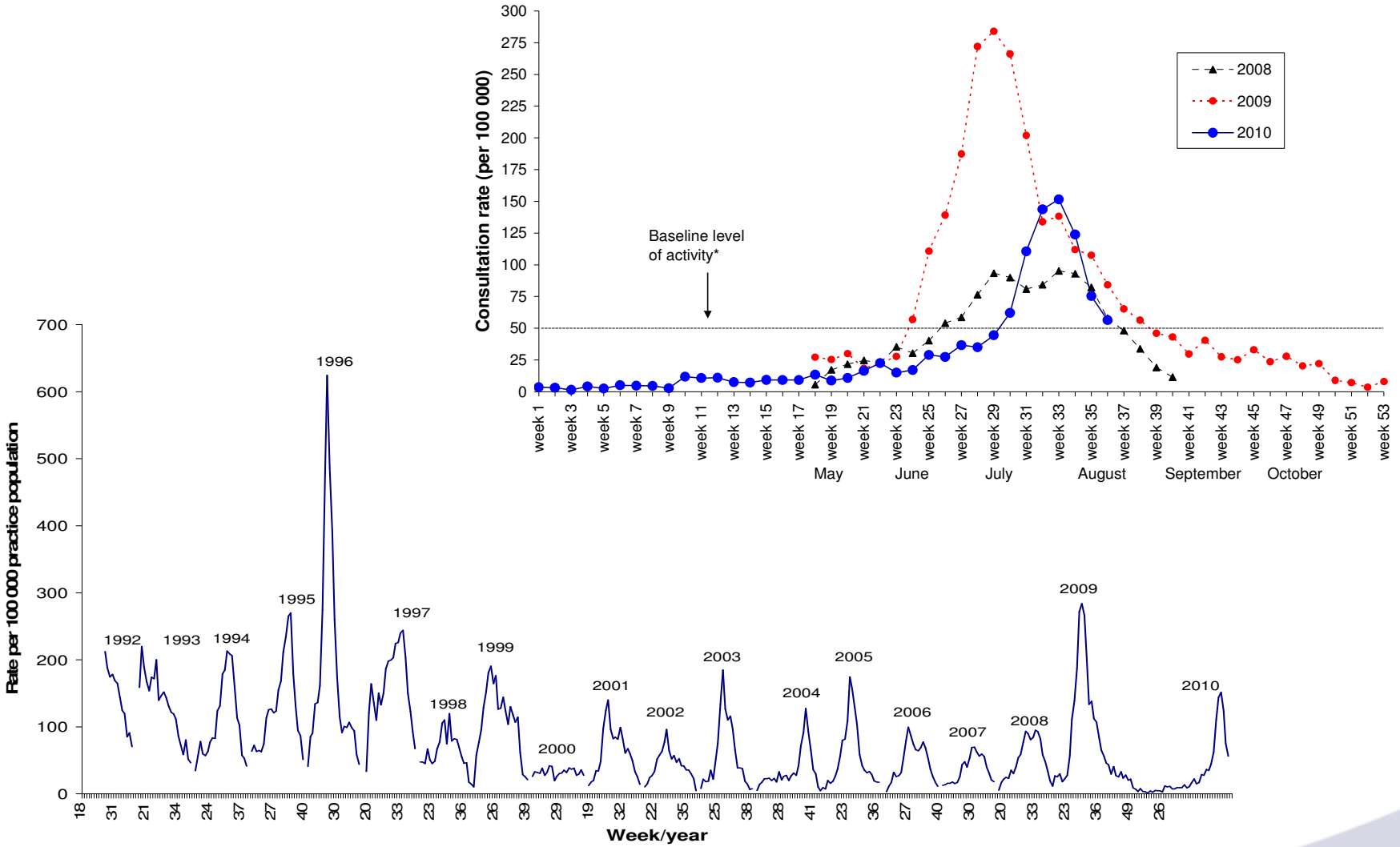
- **Strain Surveillance**
  - identify the predominant strains to help plan for effective influenza vaccines.


Influenza Surveillance
2006
Percentage of population covered by sentinel surveillance for health districts in NZ
National coverage:
10.2 % of 2006
census population
Population Coverage (%)
0
1 - 5
6 - 10
11 - 15
16 +

Sentinel General Practice Surveillance

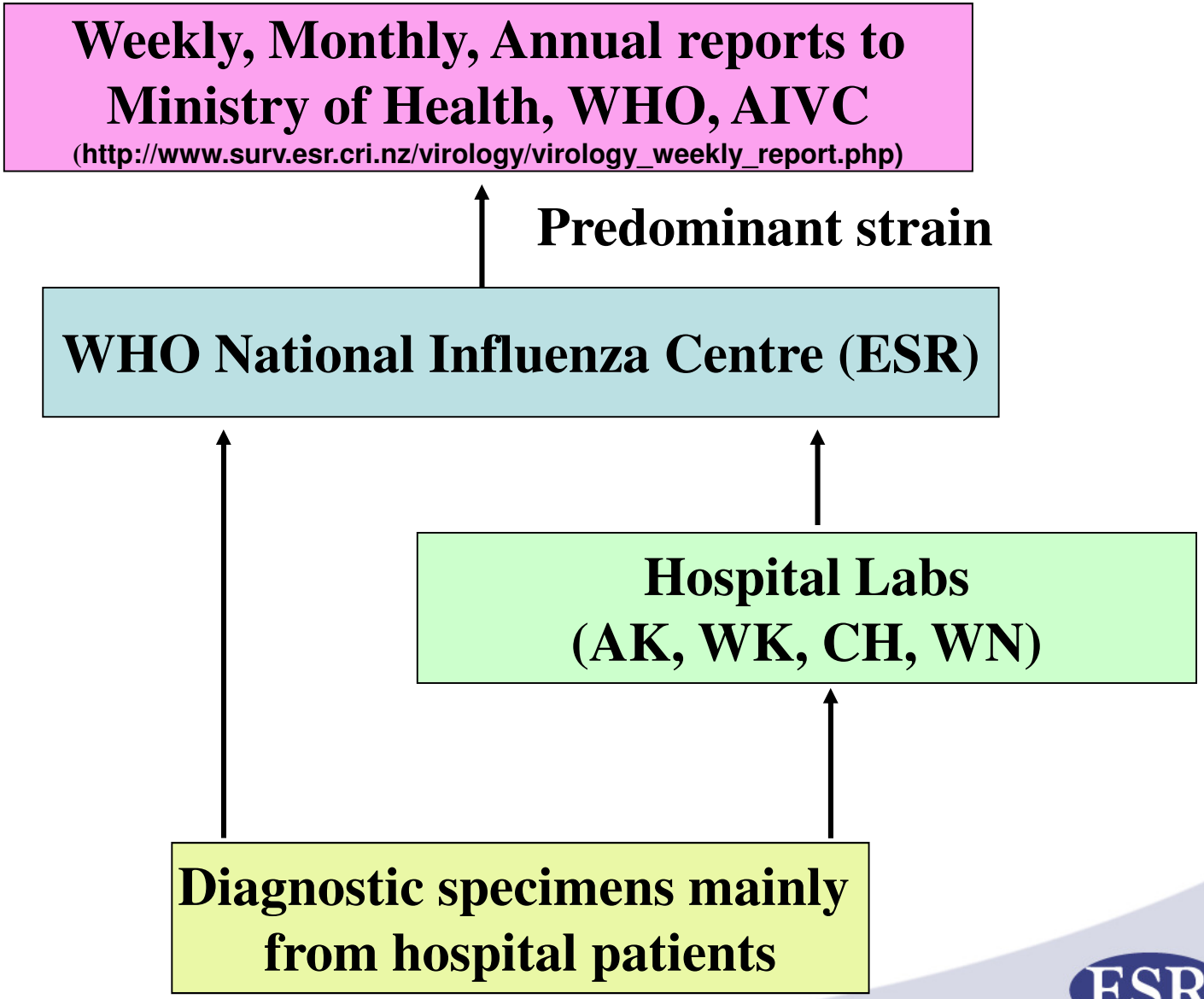


Weekly ILI consultation rates in 1992-2010

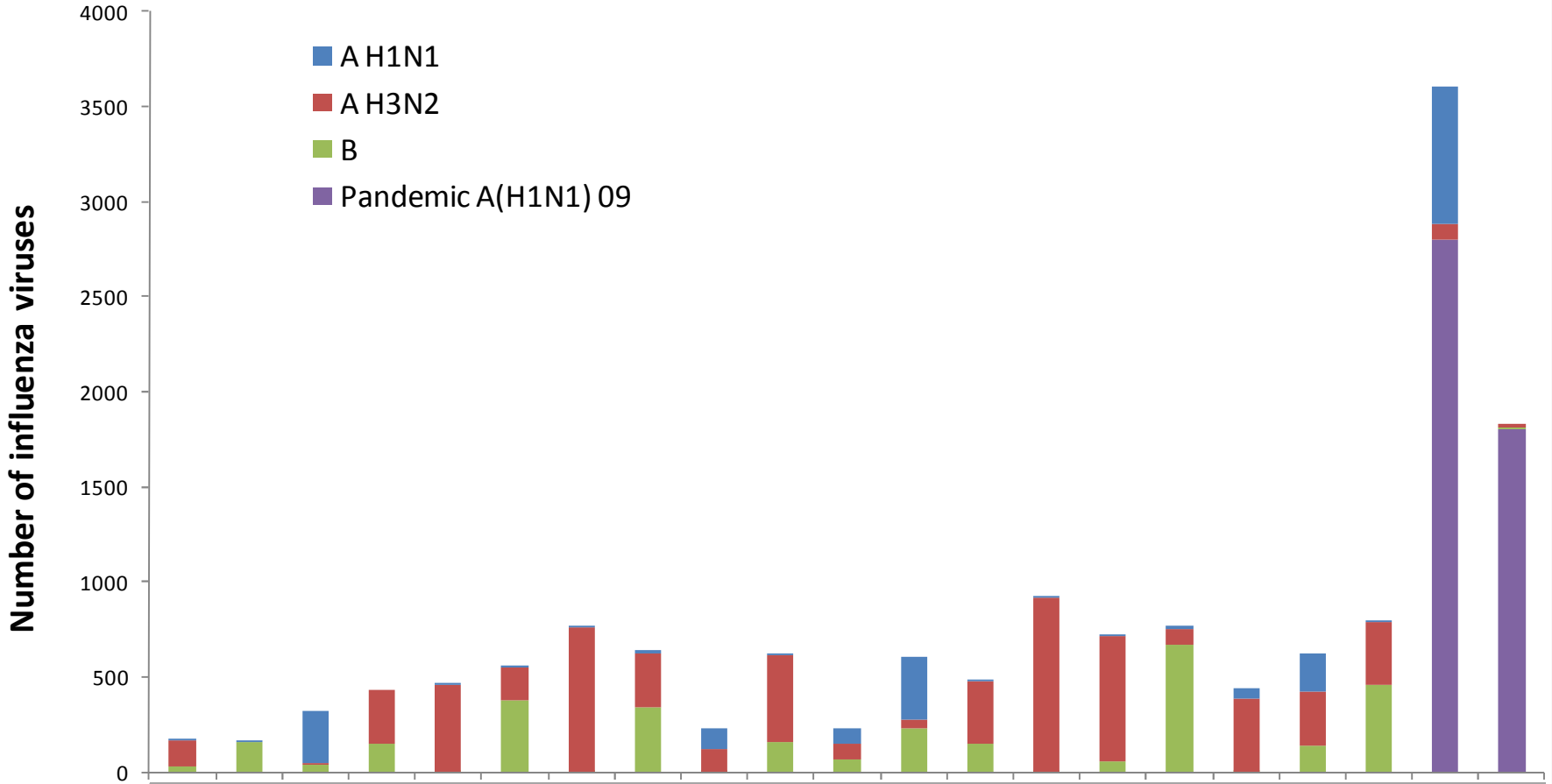


http://www.surv.esr.cri.nz/PDF_surveillance/Virology/FluVac/FluVac2011.pdf

Laboratory-based Surveillance



Predominant Influenza Strains, 1990-2010



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
A H1N1	0.6%	7.7%	85.7%	0.0%	0.2%	1.1%	0.3%	3.6%	47.4%	0.3%	36.0%	54.4%	0.4%	0.1%	0.1%	2.3%	12.6%	32.1%	0.8%	20.1%	0.0%
A H3N2	83.2%	0.0%	2.8%	65.7%	98.7%	30.1%	99.1%	43.0%	51.7%	73.7%	32.9%	7.9%	68.0%	99.6%	91.3%	10.7%	86.3%	45.0%	41.0%	2.2%	0.7%
B	16.2%	92.3%	11.5%	34.3%	1.1%	68.8%	0.7%	53.5%	0.9%	26.0%	31.1%	37.8%	31.6%	0.3%	8.6%	87.0%	1.1%	23.0%	58.3%	0.0%	0.5%
Pandemic A(H1N1) 09	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	77.7%	98.8%

http://www.surv.esr.cri.nz/PDF_surveillance/Virology/FluAnnRpt/InfluenzaAnn2010.pdf

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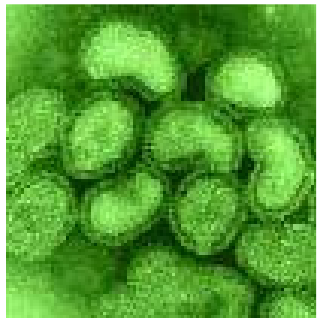

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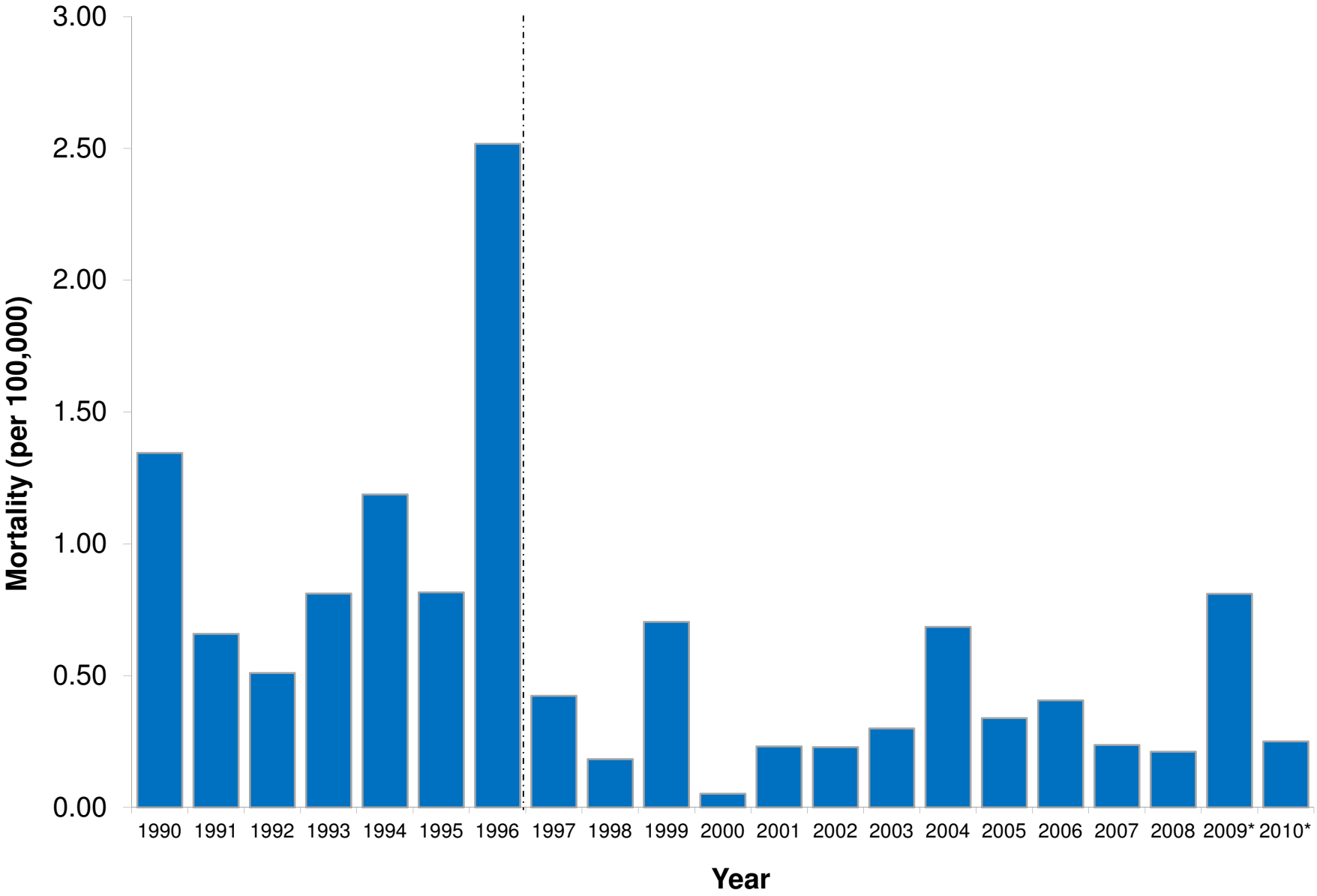
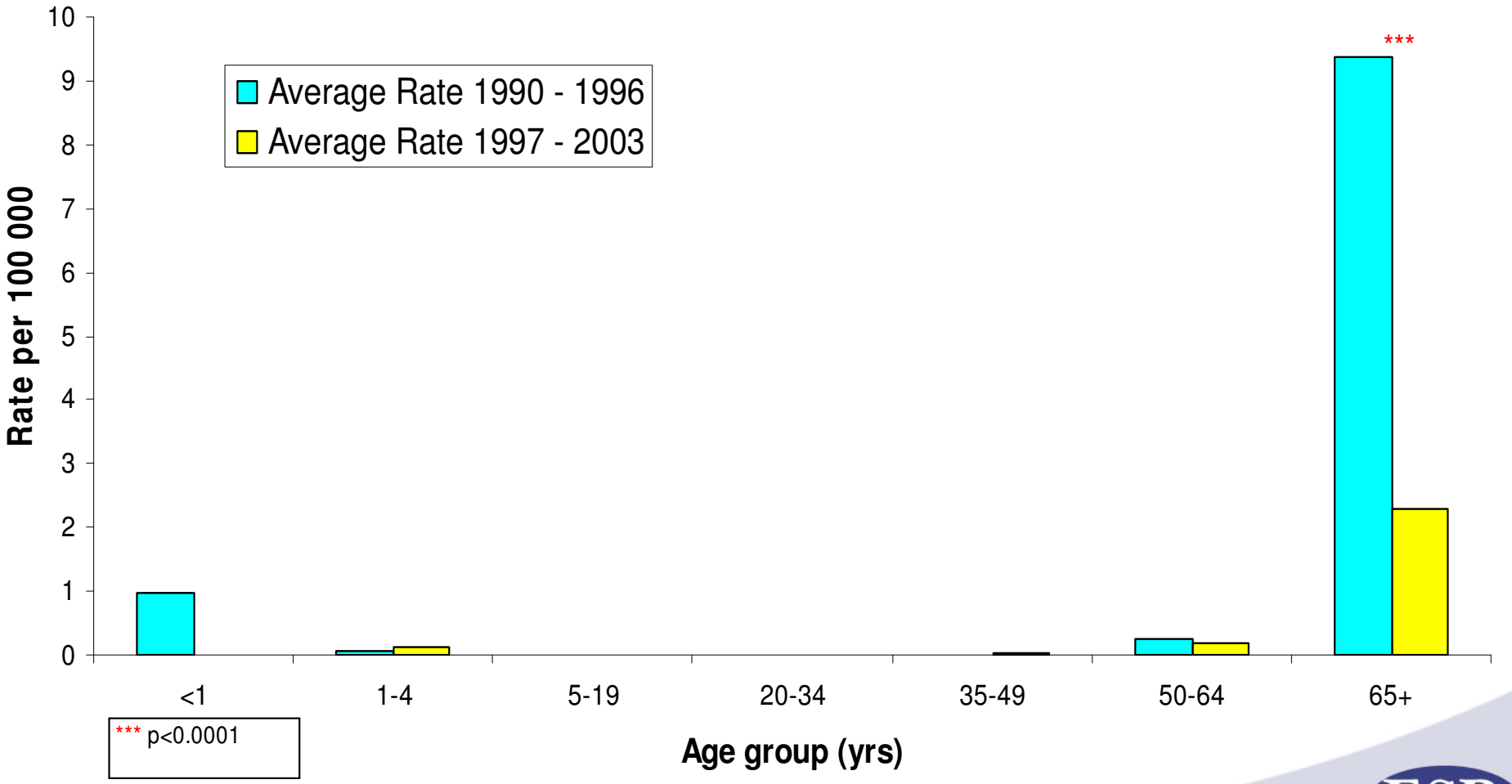
Mortality rates during 1990-2010



http://www.surv.esr.cri.nz/PDF_surveillance/Virology/FluAnnRpt/InfluenzaAnn2010.pdf

Comparison of the average mortality rates between 1997-2003 and 1990-1996 by age group



Huang et al, Influenza and other respiratory viruses 2008; 2:139-145

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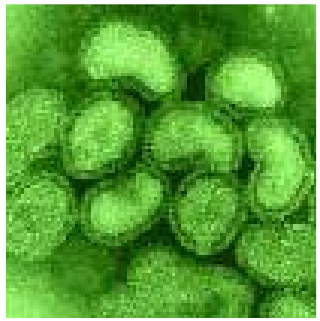

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Oseltamivir resistance monitoring

Influenza Virus	*Seasonal A(H1N1)*				*Pandemic A(H1N1)*	
Year	2006	2007	2008	2009	2009	2010
Number of viruses	17	138	4	25	483	334
Mean IC50*	1.84	0.83	728	1399	0.392	0.68
Std. dev.	0.71	0.63	136	2690	0.231	0.41
Min IC50	0.25	0.01	547	305	0.092	0.01
Max IC50	3.099	4.226	870	7912	1.402	2.05

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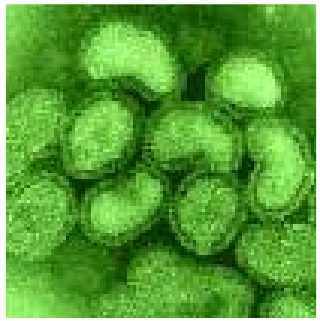

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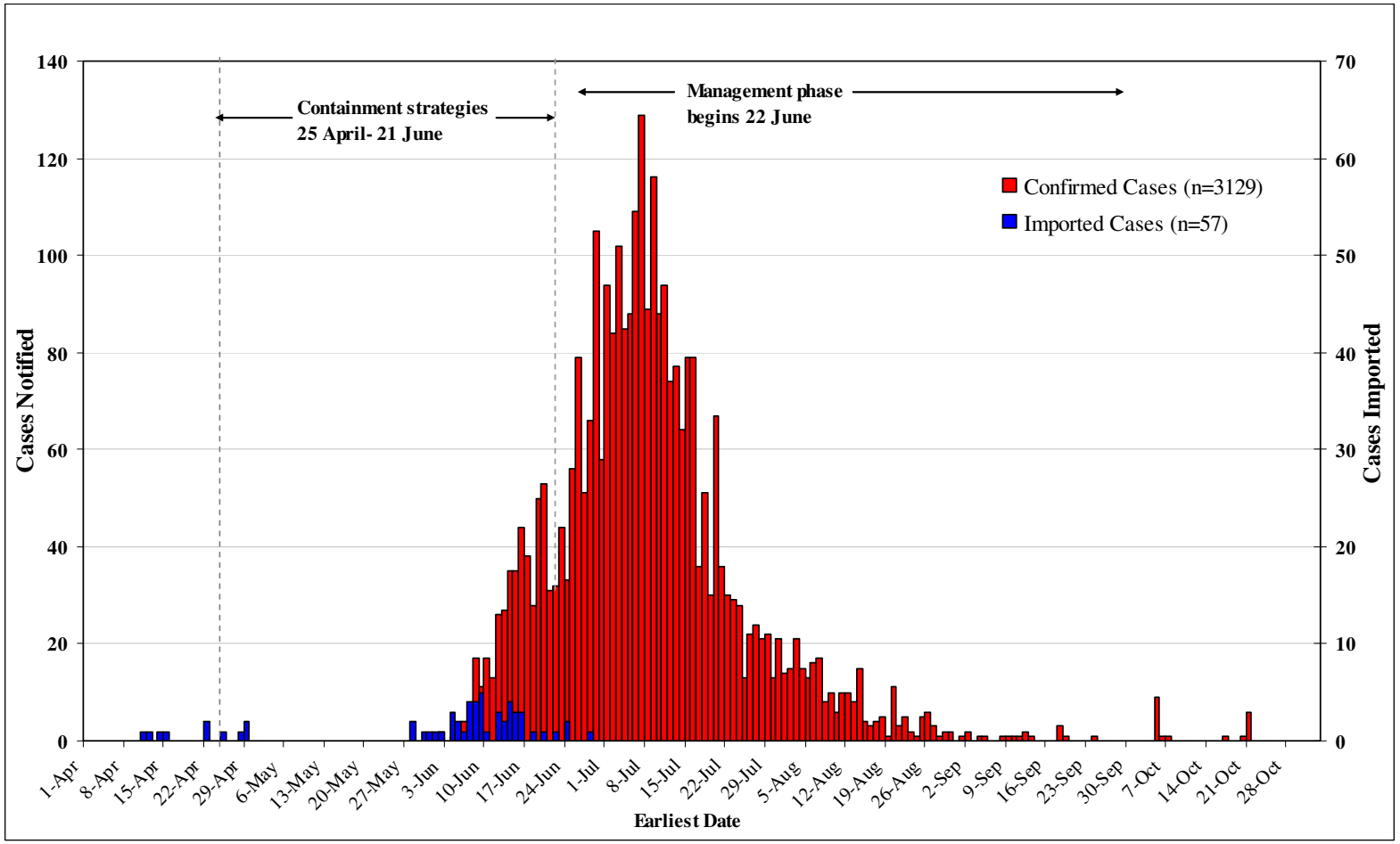
Public Health surveillance – Border control

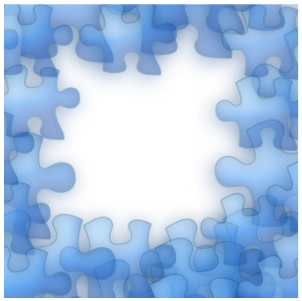


- Measures: screen arriving passengers, isolate a suspected case isolation, quarantine of contacts, test for each suspected case, offer oseltamivir treatment and prophylaxis
- 6 weeks delay for the virus to establish sustained transmission

Southern hemisphere influenza and vaccine effectiveness research and surveillance (SHIVERS)

1. Understand severe respiratory diseases caused by influenza & other pathogens
2. Assess influenza vaccine effectiveness
3. Investigate interaction between influenza & other pathogens
4. Understand causes of respiratory mortality
5. Understand non-severe respiratory diseases caused by influenza & other pathogens
6. Estimate influenza infection by conducting serosurvey
7. Identify & quantify risk factors (age, ethnicity, SES etc) for getting influenza
8. Assess immune response among individuals with varying disease spectrum
9. Estimate healthcare, societal economic burden caused by influenza and vaccine cost-effectiveness

Outcomes of the study



Comprehensive investigation of influenza epidemiology, aetiology and immunology and vaccine effectiveness.

The desired outcomes:

- Guide improved methods for disease surveillance
- Assist early detection and prediction
- Optimize clinical case management
- Optimize laboratory diagnosis
- Guide better vaccine design
- Guide targeted vaccination strategies for population and subgroups
- Understand host immune response
- Identify better immune diagnostic markers

Thank you