When the best time is launching Japanese encephalitis vaccination programs in Hong Kong – A simple decision model for policy makers

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Dear editor,

Using Japanese encephalitis (JE) as an example, we developed a decision making model for policy makers deciding the best time launching relevant vaccination programs by comparing the risk and benefit. Data of an inactivated Vero cell-derived vaccine, IXIARO®, and a most recent Hong Kong seroprevalence survey in 2004 are used in the analysis[1,2].

Risk of vaccinations (RV) is defined as serious vaccine associated complication rate that is multiplying rate of serious adverse events following immunization and recommended dosages of IXIARO®. Benefit of vaccinations (BV) is defined as protection rate against lethal JE infections among vaccine responders that is multiplying seropositivity rates, rate of encephalitis among JE infections and immunogenicity of IXIARO®.

Agresti-Coull interval and Modified Wilson interval are used to determine the 95% confidence interval of BVs in the scale of 10^{-5} and those equal to zero respectively[3]. A sensitivity analysis on immunogenicity of IXIARO® is also performed.

As shown in Table 1, general outpatient clinic patients were representing general public and the other three populations were representing potential high risk groups due to their proximity of local cases and animal reservoirs, namely pigs and water birds[2]. And 95% confidence intervals of RV and BV overlap with each other in all populations. Therefore, RV is statistical insignificantly different from BVs among all populations.

Overall, we conclude that neither universal nor target populations JE vaccination programs should be launched in the given situations which matched with the decision made by Centre for Health Protection in 2004[2]. More importantly, this methodology is applicable to all other vaccine-preventable infectious diseases.

Conflict of interest statement

We declare that we have no conflict of interest..

References

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Table 1

Risk-benefit comparison of Japanese encephalitis vaccination in Hong Kong.

Population groups	No. of specimens	Risk of vaccination per 100 000 vaccine recipients (95% confidence interval)	Benefit of vaccination per 100 000 people (95% confidence interval)	
			Maximum	Minimum
General outpatient clinic patients	1 190	3.20 (0.69–9.56)	9.41 (4.73–17.93)	8.00 (3.75–16.09)
Neighboring residents of JE cases	558		5.73 (2.23–13.07)	4.87 (1.68–11.90)
Pig farmers and abattoir workers	51		0.00 (0.00–3.69)	0.00 (0.00–3.69)
Mai Po local residents and workers	48		8.33 (3.98–16.53)	7.08 (3.12–14.88)

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