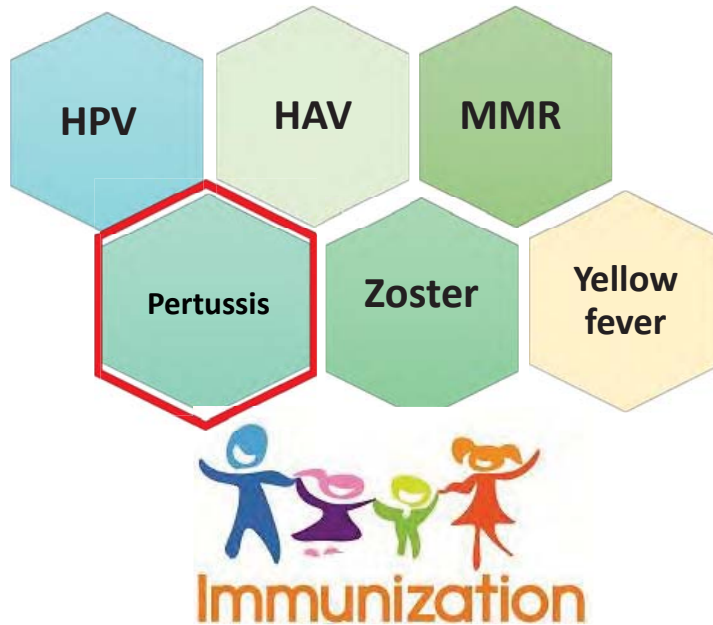


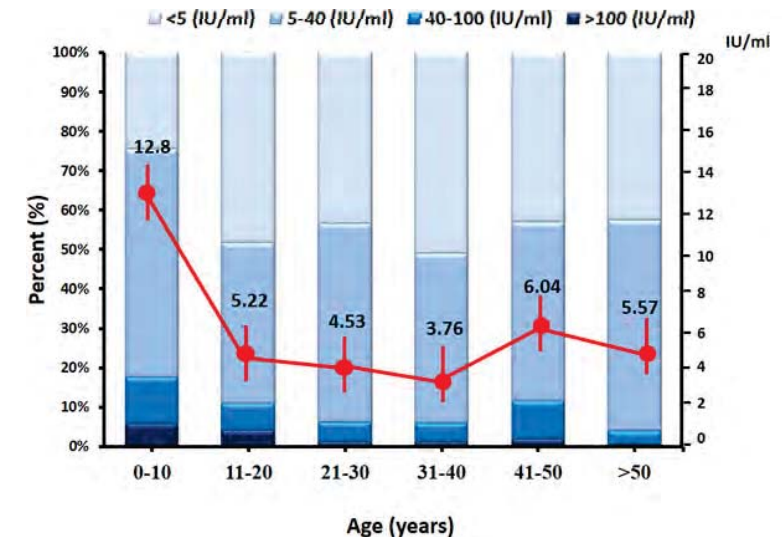
# What's new in vaccination?



## Available Tdap/TdaP Vaccine in Thailand

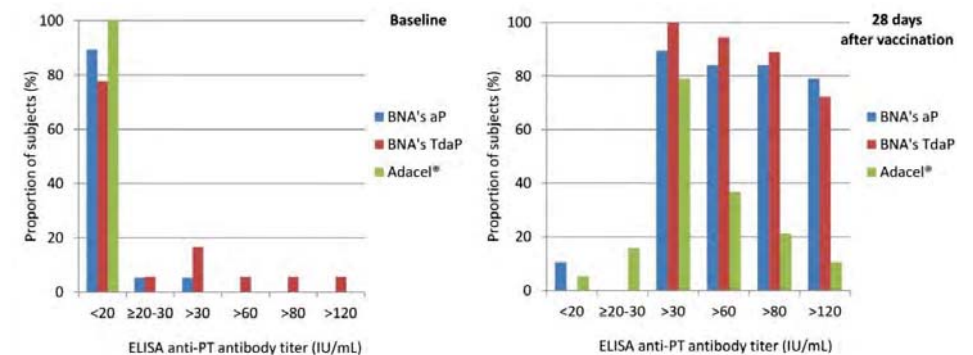
Vaccine	Manufacturer	Pertussis Ag	Age approval
Tdap (Boostrix)	GSK	PT, FHA, pertactin	≥ 4 years
Tdap (Adacel)	Sanofi Pasteur	PT, FHA, pertactin Fimbriae type 2, 3	≥ 4 years
Tdap (Boostagen)	Bionet	Recombinant PT, FHA	≥ 11 years
aP (Pertagen)			

## Seroprevalence of Antibodies to Pertussis Toxin among Different Age Groups in Thailand after 37 Years of Universal Whole-Cell Pertussis Vaccination



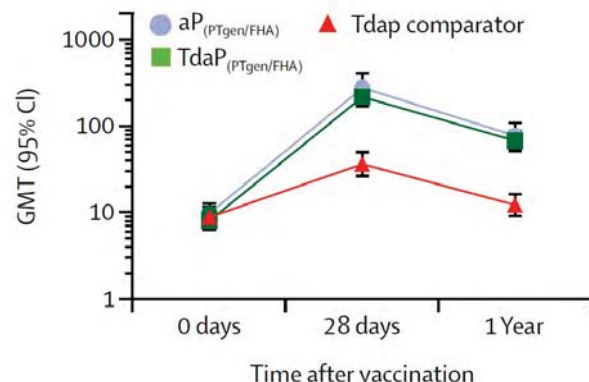
Wanlapakorn N. Seroprevalence of Antibodies to Pertussis Toxin among Different Age Groups in Thailand. PLOS ONE 11(2).

## Safety and immunogenicity of a combined Tetanus, Diphtheria, recombinant acellular Pertussis vaccine (Tdap) in healthy Thai adults



Percentages of subjects with cut-off value titers of ELISA and Nab anti-PT at baseline and 28 d after vaccination

## Antibody persistence after vaccination of adolescents with monovalent and combined acellular pertussis vaccines containing genetically inactivated pertussis toxin



GMT for antibodies against vaccine component before and after one dose

Pitisuttithum P, Chokephaibulkit K. Lancet Infect Dis. 2018 Nov; 18(11)

## Recommendations for Tdap/TdaP vaccine

Guideline	Booster Immunization				Maternal Protection			
	Preteen/Teen (11-18 years)	Adult (19-60 years)	Elderly (60 years above)	Travelers	Pregnant Women every pregnancy	Postpartum	Family (Cocooning)	Healthcare Personnel in contact with babies younger than 1 year old
U.S. Department of Health and Human Services, Centers for Disease Control and Prevention	✓	✓	✓	✓	✓	✓	✓	✓
Infectious Disease Association of Thailand	✓	✓	✓	Hajj Ceremony, Umrah Ceremony	✓	✓	✓	✓

<https://www.wnc.cdc.gov>

สมาคมโรคติดเชื้อแห่งประเทศไทย. คำแนะนำการให้วัคซีนป้องกันโรคสำหรับผู้ใหญ่และผู้สูงอายุ สมาคมโรคติดเชื้อแห่งประเทศไทย ปี พ.ศ. 2561. สมาคมโรคติดเชื้อในเด็กแห่งประเทศไทย. ตารางการให้วัคซีนในเด็กไทยปกติ แนะนำโดย สมาคมโรคติดเชื้อในเด็กแห่งประเทศไทย 2561.

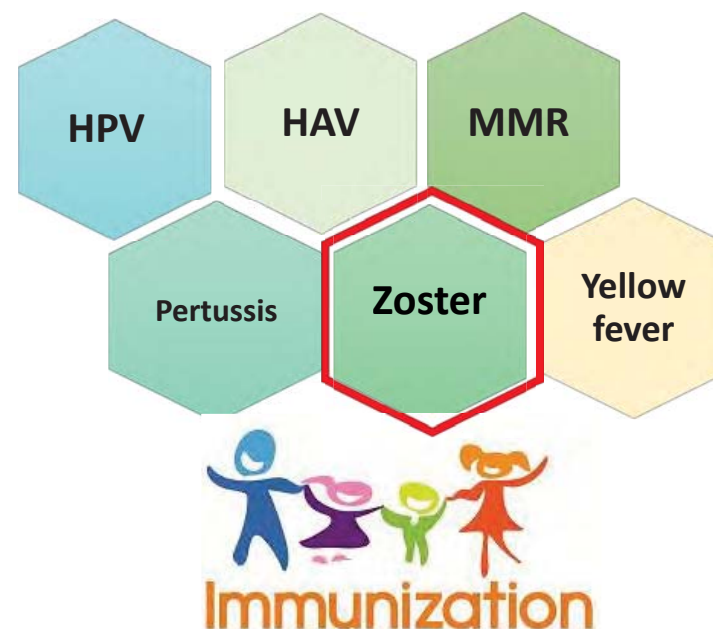
## Recommendations for Tdap/TdaP vaccine: IDAT 2018

- \* วัคซีน dT กำหนดกระตุ้นให้ 1 เข็ม ในผู้ใหญ่ทั่วไป เมื่ออายุลงท้ายด้วย 0
- \* วัคซีน Tdap กำหนดให้ 1 เข็ม ในหญิงตั้งครรภ์ ทุกครรภ์ (อยู่ระหว่างการนำเข้าสู่แผนงานสร้างเสริมภูมิคุ้มกันโรค)
- ให้ฉีด Tdap แทน Td แก่สตรีตั้งครรภ์ในไตรมาสที่ 3 และให้ฉีดวัคซีน Tdap ซ้ำ ในการตั้งครรภ์ครั้งถัดไป โดยไม่ต้องคำนึงถึงวัคซีนครั้งสุดท้าย
- หากไม่ได้ฉีดวัคซีน Tdap ขณะตั้งครรภ์แนะนำให้ฉีดทันทีหลังคลอด
- ให้ Tdap ผู้ใหญ่ทุกคนในบ้านในกรณีที่มีทารกอายุน้อยกว่า 1 ปีในบ้าน (cocooning strategy) โดยไม่ต้องสนใจวัคซีนเข็มสุดท้าย
- \* หากต้องการนำ aP มาใช้ในแผนงานสร้างเสริมภูมิคุ้มกันโรคสำหรับหญิงตั้งครรภ์ ควรรอผลจากการศึกษาประสิทธิภาพของวัคซีนก่อน

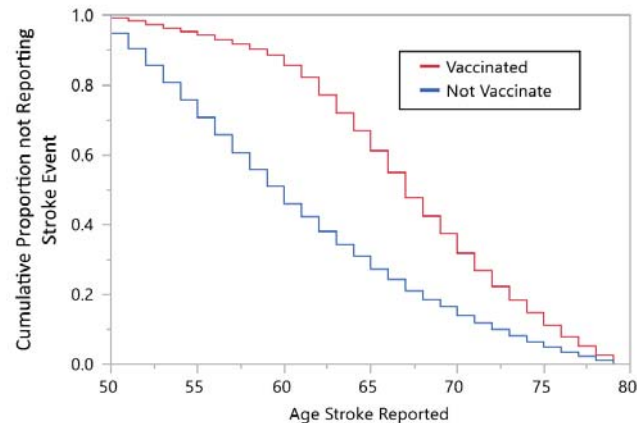
คำแนะนำการให้วัคซีนป้องกันโรคสำหรับผู้ใหญ่และผู้สูงอายุ สมาคมโรคติดเชื้อแห่งประเทศไทย ปี พ.ศ. 2561

\* การรณรงค์วัคซีนในแผนงานสร้างเสริมภูมิคุ้มกันโรค 2562-3

## What's new in vaccination?



# An Association Between Herpes Zoster Vaccination and Stroke Reduction Among Elderly



HZ-vaccinated group aged 65–69 years reported stroke ~ 50% less than unvaccinated

Military medicine, 184, ¼:126, 2019

## AVAILABLE VACCINES

### Zoster Vaccine Live ZVL

- Lived-attenuated vaccine
- FDA approve 2006
- All adults age > 60 y regardless of whether they report a prior HZ
- 1 shot
- CI: immunocompromised host, pregnancy

### Recombinant Zoster Vaccine RZV

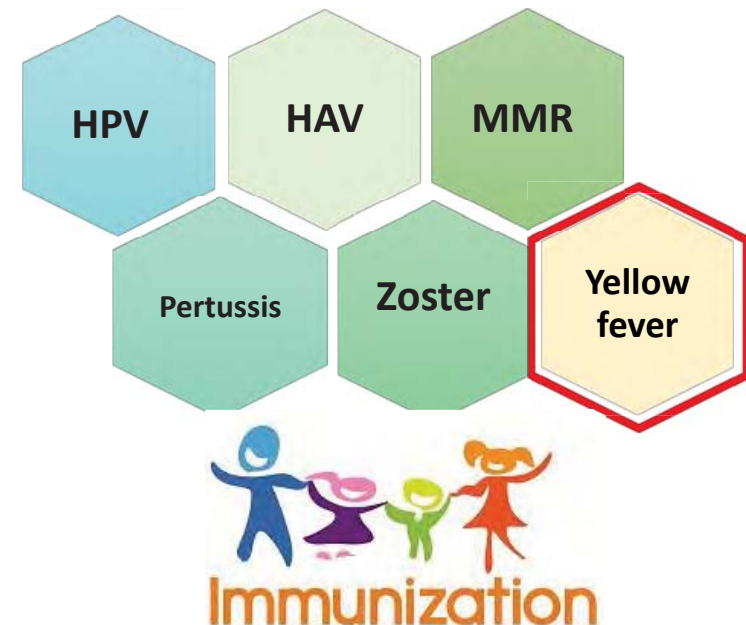
- Inactivated recombinant subunit vaccine (HZ/su)
- FDA approve Oct 2017
- > 50 years
- Higher immune response
- 0, 2 month

## Recommendations for Zoster vaccine: ACIP 2019/IDAT 2018

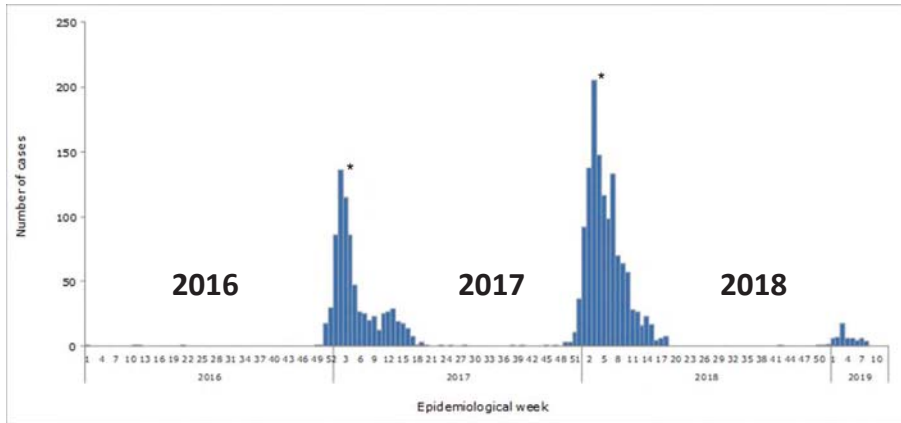
- **Age ≥ 50 years:**  
2-dose RZV
- **Age ≥ 60 years:**  
2-dose RZV or 1 dose ZVL  
RZV preferred over ZVL
- **Severe immunocompromised hosts:** ZVL is contraindicated
  - ประสิทธิภาพในการป้องกันโรคของวัคซีนลดลงเมื่อให้วัคซีนในผู้ที่อายุมากกว่า 69 ปี
  - ประสิทธิภาพในการป้องกันโรคของวัคซีนลดลงเหลือเพียงร้อยละ 31 ภายหลังได้รับวัคซีนมานานกว่า 8 ปี
- อาจมีความจำเป็นต้องให้ฉีดวัคซีนเข็มกระตุ้นภายหลังการฉีดวัคซีนเข็มแรก

Morbidity and Mortality Weekly Report (MMWR) / February 8, 2019  
คำแนะนำการให้วัคซีนป้องกันโรคสำหรับผู้ใหญ่และผู้สูงอายุ สมาคมโรคติดต่อแห่งประเทศไทย ปีพ.ศ. 2561

## What's new in vaccination?



## Distribution of confirmed human yellow fever cases Brazil, 2016–2019.



Cases of yellow fever acquired in Brazil were reported **among travelers** most of whom arrived from countries where the vector is absent

<https://www.who.int/csr/don/18-april-2019-yellow-fever-brazil/en/>

## Update yellow fever vaccine administration

- A single 0.5 mL injection for all eligible traveler
- Long-lasting protection for most travelers
- Consider booster for travelers who last dose of YF vaccine  $\geq 10$  years + higher-risk settings
- Fractional dosing: No FDA and IHR approval
- !! Proof of vaccination may not be issued !!
- Precaution and contraindication

CDC yellow book 2020



After outbreak in 2017-8  
1. Updated CDC map  
2. Fractional dose of vaccine

- A fractional dose yellow fever vaccine was effective at seroconversion at baseline
- Titers remained 1 year after vaccination in nearly participants

Casey RM. N Engl J Med. 2019 Aug 1;381(5)  
CDC yellow book 2020

## Outline

- What's new in vaccination?
- **The new vaccine pipeline**





# WHO Product Development for Vaccines Advisory Committee (PDVAC) meeting - 2019

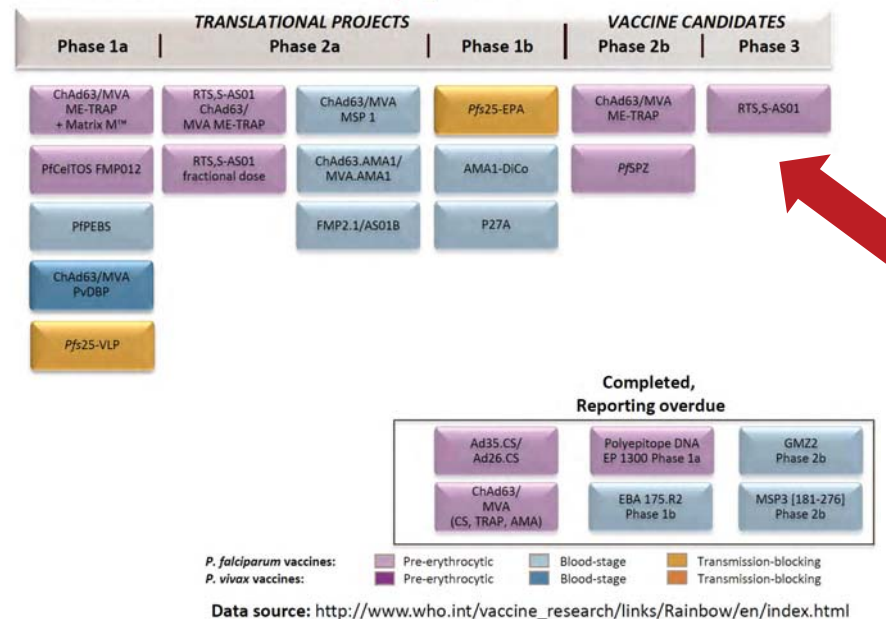


## Prioritization of pipeline candidates

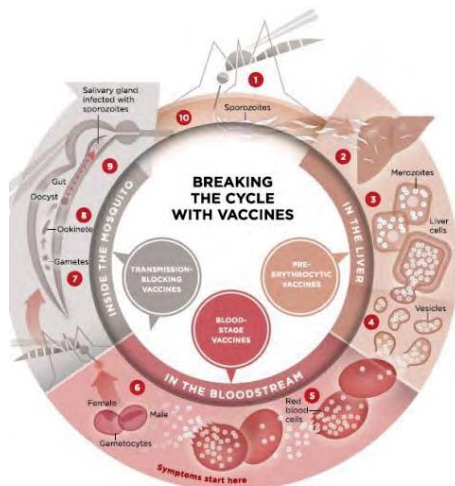
Antigen	Vaccine candidate	Platform	Phase	Rationale for inclusion	Reference
Malaria	RTS,S	Adjuvanted recombinant protein (ARP)	IV	Potential for inclusion of fractional dose in schedule (currently 4 doses)	NCT03806465
Ebola	rVSV-ZEBOV	viral vector	compassionate use	Requires storage at -80°C	<a href="https://www.who.int/ebola/drc-2018/faq-vaccine/en/">https://www.who.int/ebola/drc-2018/faq-vaccine/en/</a>
Human immunodeficiency virus (HIV)	P5: ALVAC/gp120 + MF59	viral vector + ARP	I/IIb/III	Heterologous prime boost approach, requiring 2 different vaccines in the same regimen	NCT02968849
Influenza (pandemic)	VAL-506440	lipid nanoparticle (LNP)-formulated, modified mRNA	I	Novel vaccination platform with applicability to emergency response pathogens	NCT03076385
Mycobacterium tuberculosis	VPM1002	recombinant BCG	II/III	New generation BCG approaches in late stage clinical development still require ID administration	NCT03152903
Respiratory syncytial virus (RSV)	ResVax	ARP	III	Potential for near term licensure; use of mapping innovations that could facilitate delivery in LMICs	NCT02624947
Enterotoxigenic E coli (ETEC)	Etvax	Inactivated whole cell + adjuvant	IIb	Complex formulation, including multiple components	EUCTR2016-002690-35-FI

WHO Product Development for Vaccines Advisory Committee (PDVAC) meeting – 2019, 26-28 June 2019

## Global malaria vaccine pipeline



## The RTS,S malaria vaccine



- The first malaria vaccine for **children**
- Target vaccine -> prevent *Plasmodium falciparum* from liver
- Efficacy **39%** in malaria
- 29% in severe cases
- National immunization programs in **Ghana, Kenya, and Malawi**
- Immunity waned over time
- Phase 4 studies on going

<https://www.malariavaccine.org/malaria-and-vaccines/rtss>

## 2019 ACIP/MMWR Recommended Adult Immunization Schedule by Age

Vaccine	19-21 years	22-26 years	27-49 years	50-64 years	≥65 years
Influenza inactivated (IIV) or Influenza recombinant (RIV) <b>or</b> Influenza live attenuated (LAIV)	1 dose annually				
Tetanus, diphtheria, pertussis (Tdap or Td)	1 dose Tdap, then Td booster every 10 yrs				
Measles, mumps, rubella (MMR)	1 or 2 doses depending on indication (if born in 1957 or later)				
Varicella (VAR)	2 doses (if born in 1980 or later)				
Zoster recombinant (RZV) (preferred) <b>or</b> Zoster live (ZVL)					2 doses <b>or</b> 1 dose
Human papillomavirus (HPV) Female	2 or 3 doses depending on age at initial vaccination				
Human papillomavirus (HPV) Male	2 or 3 doses depending on age at initial vaccination				
Pneumococcal conjugate (PCV13)	1 dose				
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses depending on indication				1 dose
Hepatitis A (HepA)	2 or 3 doses depending on vaccine				
Hepatitis B (HepB)	2 or 3 doses depending on vaccine				
Meningococcal A, C, W, Y (MenACWY)	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
Meningococcal B (MenB)	2 or 3 doses depending on vaccine and indication				
Haemophilus influenzae type b (Hib)	1 or 3 doses depending on indication				

  Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection  
  Recommended vaccination for adults with an additional risk factor or another indication  
  No recommendation

## 2019 ACIP/MMWR Recommended Adult Immunization Schedule by conditions

Vaccine	Pregnancy	Immunocompromised (excluding HIV Infection)	HIV infection CD4 count <200	Asplenia, complement deficiencies	End-stage renal disease, on hemodialysis	Heart or lung disease, alcoholism	Chronic liver disease	Diabetes	Health care personnel <sup>†</sup>	Men who have sex with men
IIV or RIV or LAIV										1 dose annually
	CONTRAINDICATED									1 dose annually
Tdap or Td	1 dose Tdap each pregnancy									1 dose annually
MMR	CONTRAINDICATED									1 or 2 doses depending on indication
VAR	CONTRAINDICATED									2 doses
RZV (preferred) or ZVL	DELAY									2 doses at age ≥50 yrs
	CONTRAINDICATED									1 dose at age ≥60 yrs
HPV Female	DELAY	3 doses through age 26 yrs								2 or 3 doses through age 26 yrs
HPV Male		3 doses through age 26 yrs								2 or 3 doses through age 21 yrs
PCV13										1 dose
PPSV23										1, 2, or 3 doses depending on age and indication
HepA										2 or 3 doses depending on vaccine
HepB										2 or 3 doses depending on vaccine
MenACWY										1 or 2 doses depending on indication, then booster every 5 yrs if risk remains
MenB	PRECAUTION									2 or 3 doses depending on vaccine and indication
Hib		3 doses HSCT <sup>†</sup> recipients only								1 dose

  Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack:   Recommended vaccination for adults with an additional risk factor or another:   Precaution—vaccine might be indicated if benefit of protection outweighs risk of:   Delay vaccination until after pregnancy if vaccine is indicated:   Contraindicated—vaccine should not be administered because of risk for serious:   No recommendation

## Adult and Elderly Immunization 2018

Vaccines <sup>1</sup>	Age groups (years)		
	19 – 26 years	27 – 64 years	≥ 65 years
Tetanus, diphtheria, pertussis vaccine (Td or Tdap) <sup>1</sup>	Boost with 1 dose of Td every 10 years (eg, at age 20, 30, 40, 50, 60, ...)		
	Substitute one-time of Td with Tdap <sup>1</sup>		
Varicella vaccine <sup>4</sup>	2 doses (consider Anti-VZV IgG test before vaccination)		
Measles, mumps, rubella (MMR) vaccine <sup>5</sup>	2 doses (age ≤ 40 years)		
Human Papillomavirus (HPV) vaccine	3 doses (female) <sup>7</sup>		
	3 doses (male) <sup>1</sup>		
Inactivated influenza vaccine <sup>6</sup>	1 dose annually <sup>2</sup>		
Hepatitis A vaccine <sup>10</sup>	2 doses	2 doses (consider anti HAV IgG test before vaccination)	
Hepatitis B vaccine <sup>11</sup>	3 doses (consider Anti-HBs, Anti-HBc and HBsAg test before vaccination)		
23-valent pneumococcal polysaccharide vaccine (PPV-23) <sup>12</sup>			1 dose
13-valent pneumococcal conjugate vaccine (PCV-13) <sup>13</sup>			1 dose
Dengue vaccine <sup>14</sup>	3 doses (age ≤ 45 years)		
Live-attenuated zoster vaccine <sup>15</sup>			1 dose (age ≥ 60 years)

Recommended vaccine	Optional vaccine (considered in specific conditions: ตารางที่ 2)	Not recommended	Contraindication
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สมาคมโรคติดเชื้อแห่งประเทศไทย ปี พ.ศ. 2561.

<http://www.idsthai.org/2015/index.php>



## Acknowledgement

- Prof. Kulkanya Chokephaibulkit, MD
- Infectious Diseases Association of Thailand



# Thank You



Not Vaccinated?  
No Kisses, please..

Available on: <https://www.vaxcorpindo.com/pertussis-parents-killing-baby/>