

Imunisasi: Apa dan Mengapa?

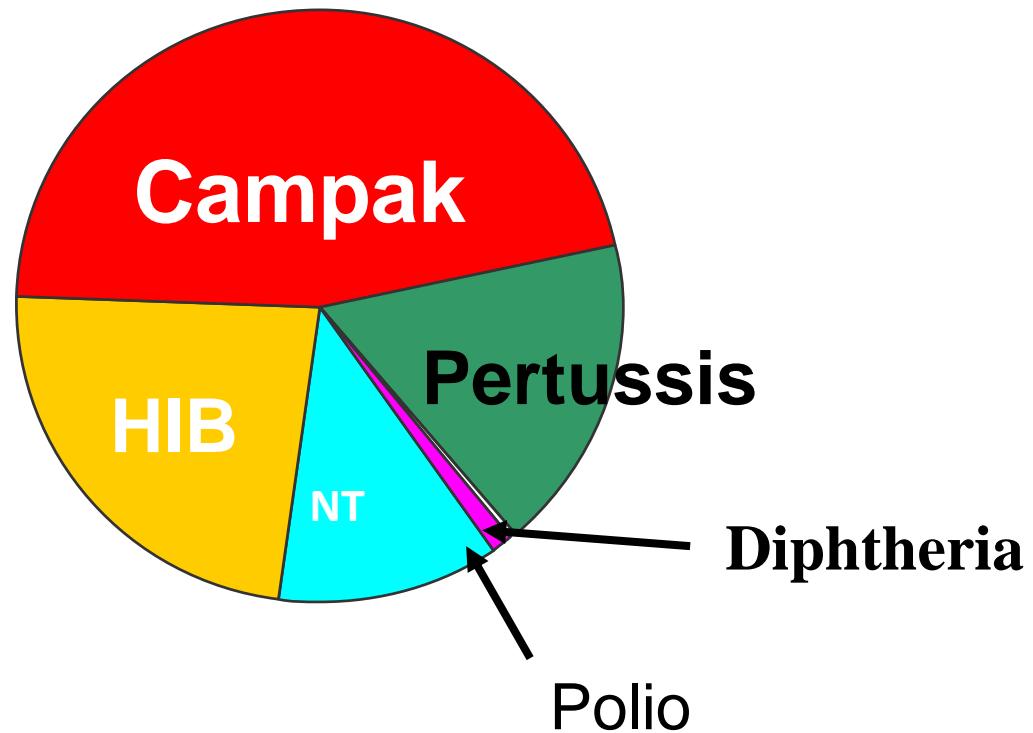
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Penyebab kematian pada anak di seluruh dunia



Apa itu sistem imun (kekebalan tubuh)?

- Imunitas adalah fenomena biologis yang terdiri dari keseimbangan kemampuan sel kekebalan mengenali sel ‘milik sendiri’(self) dan sel ‘asing’ (not self)
- Ada 2: innate (nonspesifik) dan adaptive (didapat atau spesifik)
- Gangguan sistem imun dapat mengakibatkan penyakit autoimun, alergi dan tumor atau cancer

Istilah dalam Sistem Imun

- ANTIGEN (Ag) adalah makromolekul yang berupa benda asing atau senyawa yang dapat memicu respon imun.
- ANTIBODY atau IMMUNOGLOBULIN (Ig) adalah molekul sistem kekebalan. Molekul ini berikatan dengan antigen untuk kemudian dikenali, diingat dan dihancurkan karena dikenali sebagai benda asing yang merugikan tubuh kita

Istilah dalam Sistem Imun

- LIMFOSIT adalah sel utama sistem imun. Terdiri dari sel T dan sel B. Sel lain (Makrofag, Sel dendritik, Netrofil, Sel mast dll) ikut terlibat dalam reaksi imun.

Fungsi Utama Sistem Imun:

1. Pertahanan diri dari benda asing (not-self) dengan mekanisme non spesifik maupun spesifik
2. Eliminasi sel-sel diri sendiri (self) yang mengalami kelainan (modifikasi)
3. Pengaturan maturasi/pematangan dan pertumbuhan sel/jaringan.

Bagaimana sistem imun kita bekerja?

Mekanisme Non Spesifik/Innate

- Pertahanan alami: Kulit, epitel bersilia, kelenjar keringat, enzim pencernaan dll
- Mikroba normal yang melapisi seluruh permukaan tubuh .
- Liver (cytochrome P450 system).
- Sistem Komplemen
- Fagositosis (kemampuan sel makrofag memakan benda asing)
- Interferons (IFNs), NK cells
- Reaksi fase akut
- Sitokin
- Antibodi alami

Bagaimana sistem imun kita bekerja?

Respon Imun Spesifik atau Adaptif

- **HUMORAL**, atau respon imun yang diperantarai sel Limfosit B yang memicu produksi sel plasma yang mengeluarkan imunoglobulin (IgM, IgG, IgA, IgE, IgD).
- **SELULAR** atau respon imun yang diperantarai sel Limfosit T yang menghasilkan pembentukan sel T efektor:
 1. Cytotoxic T cells (killer T cells).
 2. Effector T cells of the immune inflammation.

ORGAN SISTEM IMUN

- Sistem Imun Sentral (primer) dan Perifer (sekunder)
- **Sentral:** **SUMSUM TULANG** → tempat kelahiran semua sel imun dan tempat maturitas sel B (B lymphopoiesis). **THYMUS** → tempat maturasi sel T (T lymphopoiesis). Kedua organ ini merupakan pusat sistem imun

ORGAN SISTEM IMUN

Perifer (Sekunder):

- Kelenjar limfe, saluran limfe dan Limpa (Spleen)
- Mucous associated lymphoid tissue (MALT) seperti tonsil, Peyer's patches, isolated follicles, appendix, etc.
- Yang termasuk MALT:
Eustachian tube – TALT, nasal – NALT, bronchus (including mammary glands in females) – BALT, gut – GALT (small and large intestines).
- Skin associated lymphoid tissue (SALT).

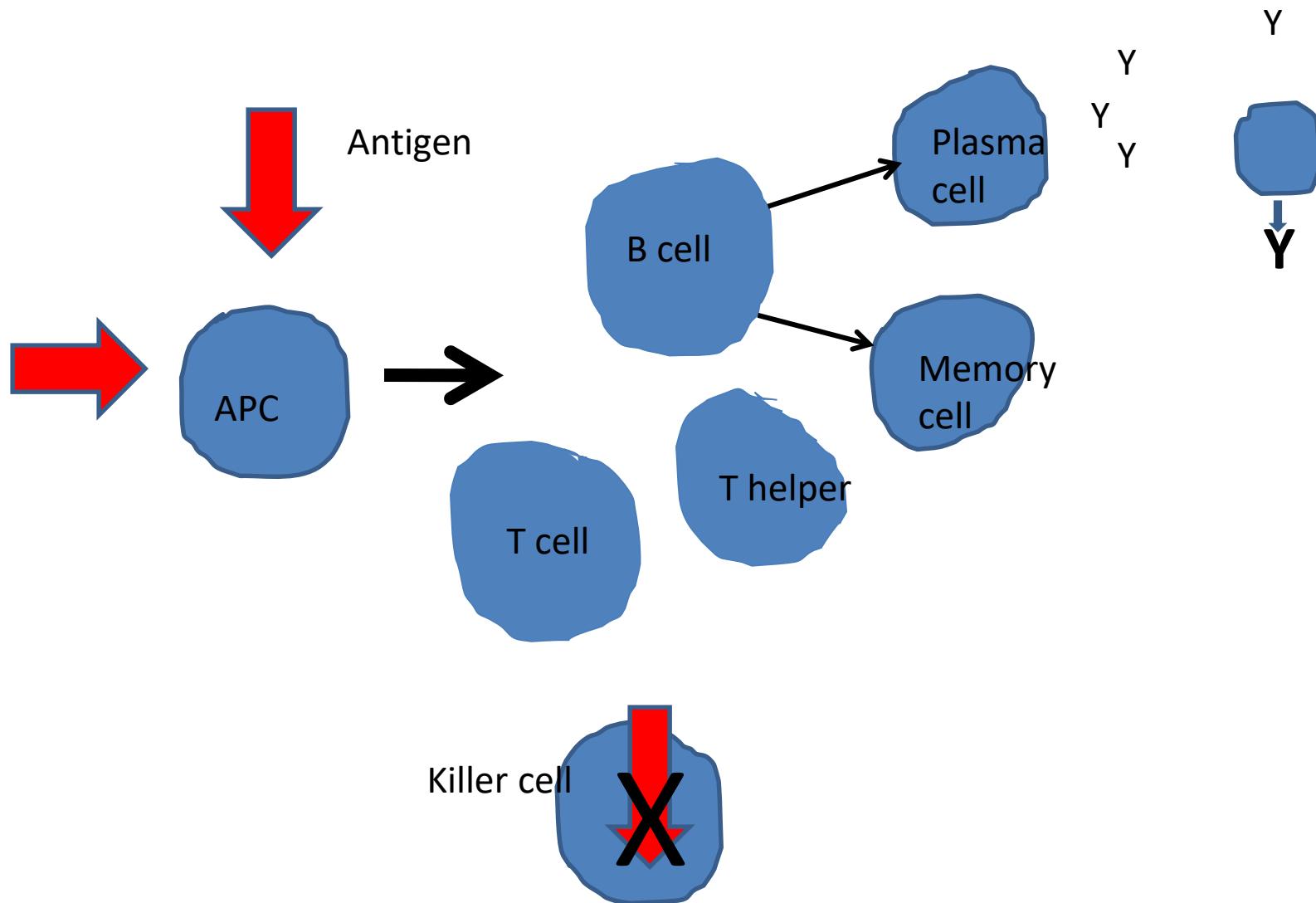
Fungsi sel-sel imun:

- ANTIGEN-PRESENTING CELLS:
 - Macrophages, type 1 and type 2 dendritic cells, B cells.
- REGULATORY CELLS:
 - Native regulatory T cells (T_{reg}), inducer T cells, type 1 helper T cells, type 2 helper T cells, type 3 helper T cells, type 1 regulatory T cells.

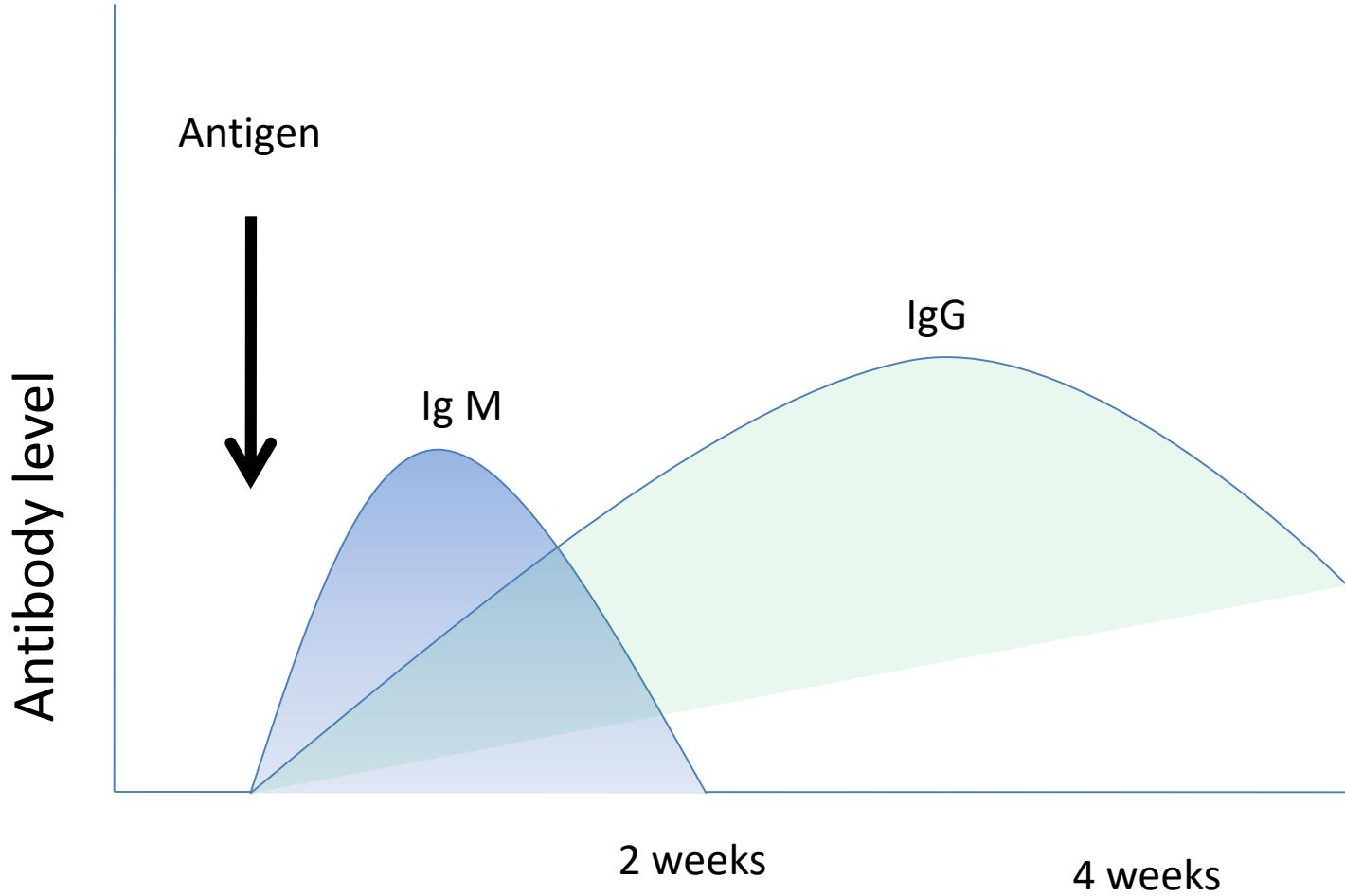
Fungsi sel-sel imun:

- Sel-sel efektor:
 - Sel B (berdiferensiasi menjadi sel plasma).
 - Cytotoxic CD8+T cells (killer T lymphocytes).
 - Inflammatory effector CD4+T cells (cells responsible for delayed type hypersensitivity – T_{DH} lymphocytes).
 - Neutrophils, eosinophils, basophils, mast cells, nature killer (NK) cells, macrophages.
- SEL MEMORI:
 - Sel T Memory CD4+, Sel T memory CD8+
 - Long-lived plasma cells, Sel B Memori.

RESPON IMUN

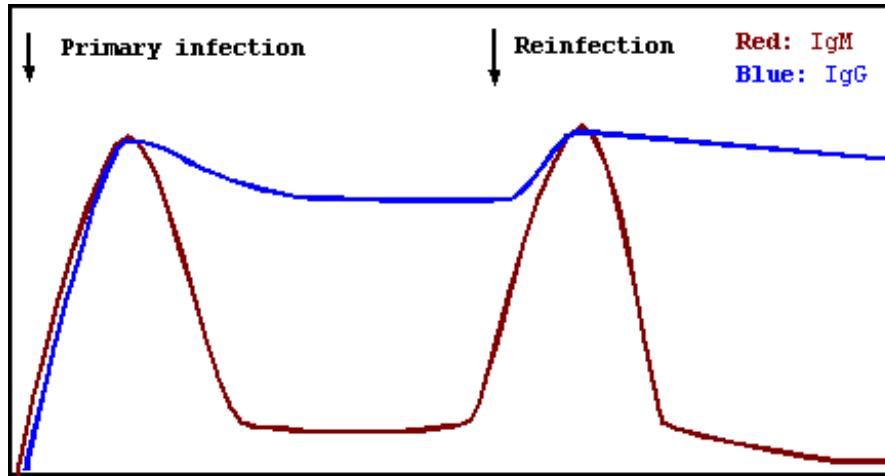


Respon dasar sistem imun



DEFINISI Imunisasi/Vaksinasi

- **Imunisasi:** CARA MENINGKATKAN KEKEBALAN baik secara AKTIF / PASIF terhadap suatu antigen tertentu dengan tujuan bila terpajan antigen serupa → tidak sakit/gejala klinis lebih ringan.
- **Vaksinasi** adalah pemberian antigen hidup yang telah dilemahkan maupun antigen yang tidak hidup atau protein dari antigen tertentu untuk menghasilkan respon imunitas yang serupa/mirip dengan infeksi alamiah tanpa menjadi sakit



IgM —

IgG —

1st boost



2nd boost



MACAM KEKEBALAN

- AKTIF : Tubuh terpajan antigen → membuat antibodi spesifik untuk membunuh antigen
- PASIF : Tubuh langsung dapat memakai untuk membunuh antigen

JENIS VAKSIN

- Vaksin Hidup yang telah dilemahkan
- Vaksin dari bakteri atau virus yang telah mati dan diambil bagian tertentu atau protein tertentu yang paling poten menimbulkan respon imun



Kelompok rentan sakit tetapi terbatas dalam menerima vaksinasi

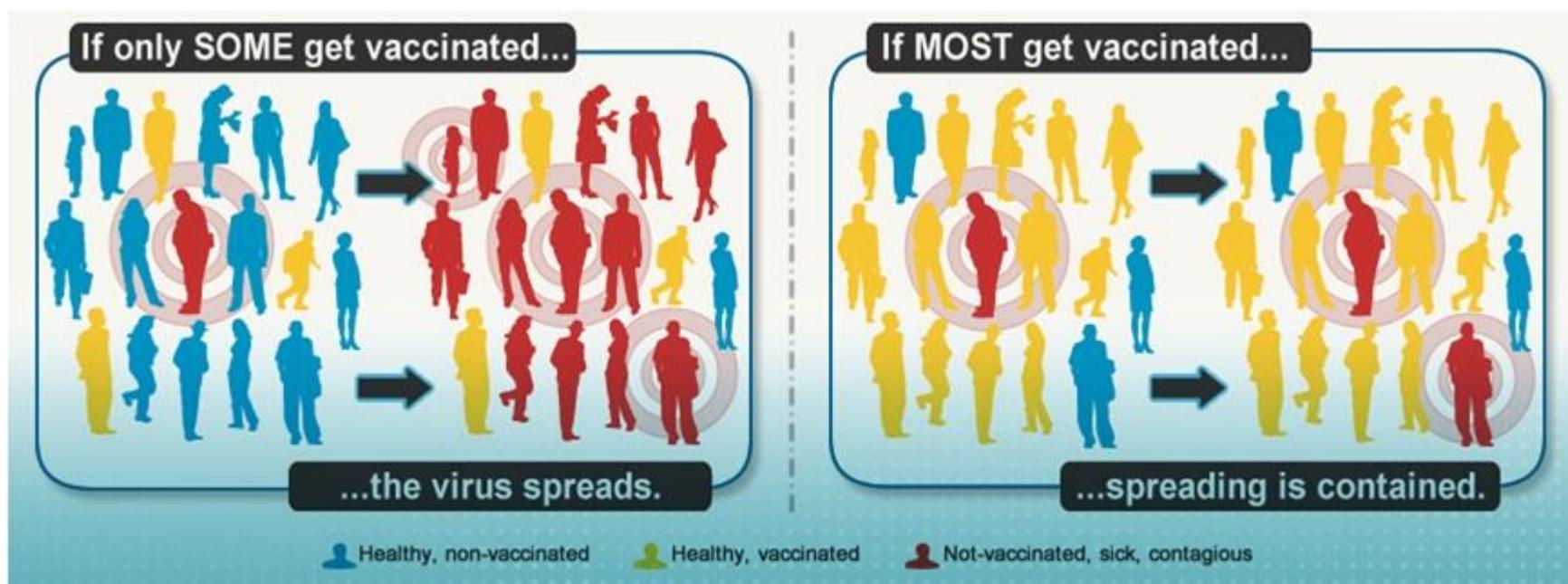
- Orang dg sistem imun yg tidak bekerja dengan baik termasuk yg mengalami kerusakan sistem limpa
- Orang dengan kemoterapi
- Orang dengan HIV
- Bayi baru lahir yang belum bisa menerima imunisasi
- Orang lanjut usia
- Orang yang sakit berat sehingga harus dirawat di rumah sakit

What is herd immunity?

- Kekebalan Kelompok (Komunitas): daya tahan kelompok atau komunitas dalam menangkal masuknya dan menyebarnya agen infeksi karena sebagian besar anggota kelompok tersebut kebal terhadap infeksi, bahkan anggota kelompok yang belum kebal tidak terinfeksi karena penyebaran infeksi dapat dikendalikan

Herd Immunity

- Kekebalan kelompok tidak mungkin terjadi bila cakupan imunisasi sangat rendah



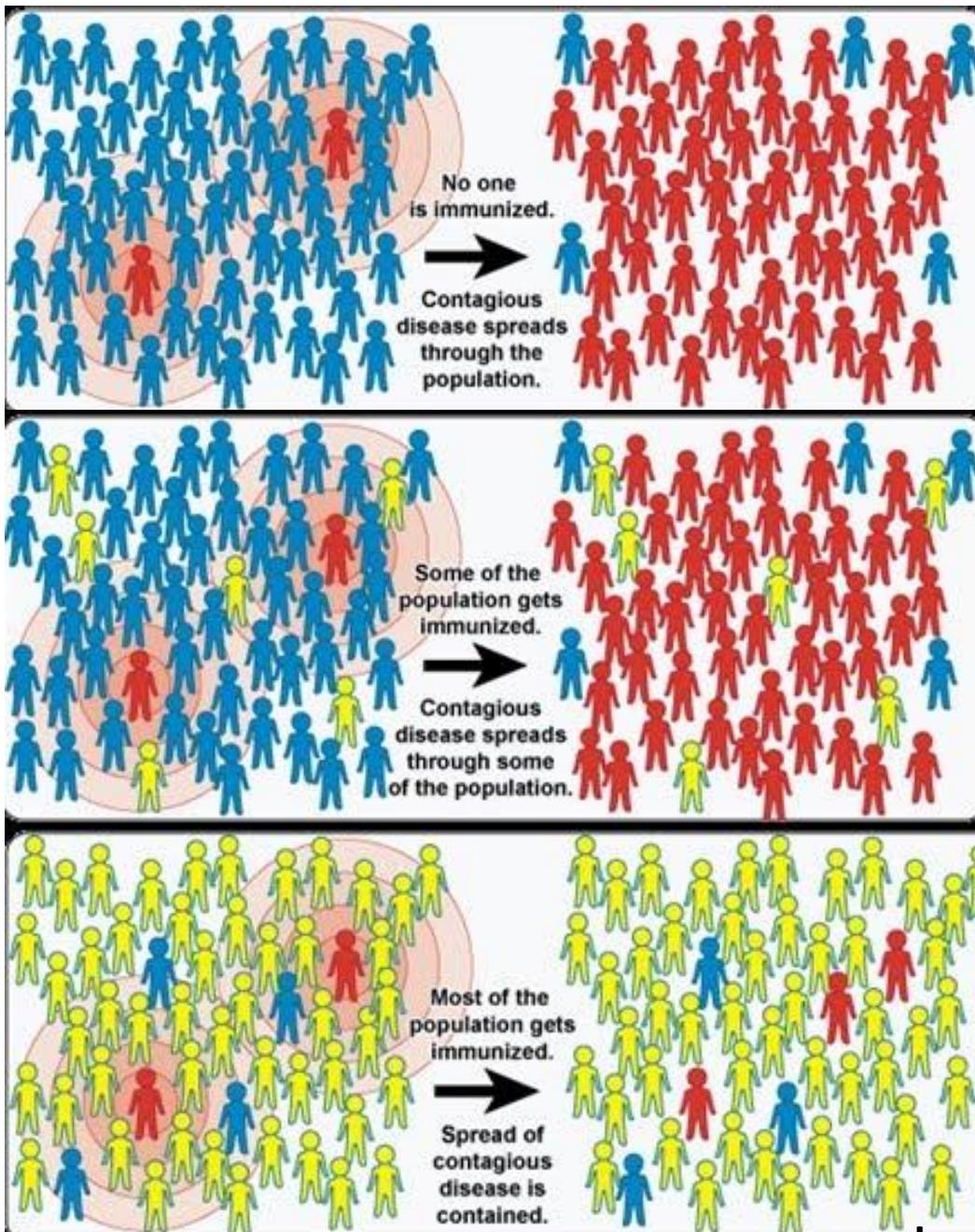


Image courtesy of NIAID

China Vaccine Schedule

Below is a basic schedule of immunization shots given in a Chinese hospital.

Korea



어린이가 건강한 대한민국

질병관리본부

KMA

예방접종전문위원회

표준예방접종일정표 (2017)

| 대상 감염병 | 백신종류 및 방법 | 회수 | 출생~ 1개월이내 | 1개월 | 2개월 | 4개월 | 6개월 | 12개월 | 15개월 | 18개월 | 19~ 23개월 | 24~ 35개월 | 만4세 | 만6세 | 만11세 | 만12세 |
|----------------------------|----------------------------------|-------------------------|--------------|-----------------|---------|-------|-------|---------|---------|---------|-----------------|------------------|--------------|-----|--------------|----------|
| 국 가 예 방 접 종 | 결핵 ^① | BCG(피내용) | 1 | BCG (피내용 1회) | | | | | | | | | | | | |
| | B형간염 ^② | HepB | 3 | HepB 1차 | HepB 2차 | | | HepB 3회 | | | | | | | | |
| | 디프테리아 파상풍 백일해 | DTaP ^③ | 5 | | | | | DTaP 1차 | DTaP 2차 | DTaP 3차 | | DTaP 4회 | | | | |
| | 풀리오 ^④ | IPV | 1 | | | | | | | | | | | | | |
| | b형헤모필루스인플루엔자 ^⑤ | PRP-T / HbOC | 4 | | | | | Hib 1차 | Hib 2차 | Hib 3차 | Hib 4차 | | | | | |
| | 페렴구균 | PCV(단백질합) ^⑥ | 4 | | | | | PCV 1차 | PCV 2차 | PCV 3차 | PCV 4차 | | | | | |
| | | PPSV(다당질) ^⑦ | - | | | | | | | | | | | | | |
| | 홍역 ^⑧ 유생성이하선염 증진 | MMR | 2 | | | | | | | MMR 1차 | | | MMR 2차 | | | |
| | 수두 | Var | 1 | | | | | | | Var 1회 | | | | | | |
| | A형간염 ^⑨ | HepA | 2 | | | | | | | | Hep A 1~2차 | | | | | |
| | 일본뇌염 | IJEV (사생신) ^⑩ | 5 | | | | | | | | IJEV(사생신) 1~3차 | | IJEV(사생신) 4차 | | IJEV(사생신) 5회 | |
| | | IJEV (생백신) ^⑪ | 2 | | | | | | | | IJEV(생백신) 1~2차 | | | | | |
| | 사람유두종바이러스 ^⑫ | HPV 2 / HPV 4 | 2 | | | | | | | | | | | | | HPV 1~2차 |
| | 인플루엔자 | IIIV(사생신) ^⑬ | - | | | | | | | | IIIV(사생신) 매년 접종 | | | | | |
| | | LAIIV(생백신) ^⑭ | - | | | | | | | | | LAIIV(생백신) 매년 접종 | | | | |
| 기타 예방 접종 | 결핵 ^⑮ | BCG(경피용) | 1 | BCG (경피용 1회) | | | | | | | | | | | | |
| | 로타바이러스 | RV1 | 2 | | | RV 1회 | RV 2회 | | | | | | | | | |
| | | RV5 | 3 | | | RV 1회 | RV 2회 | RV 3회 | | | | | | | | |

① 국가예방접종 : 국가가 권장하는 예방접종과는 같은 감염병의 예방 및 관리에 관한 법률을 통해 예방접종 마상 감염병과 예방접종의 실시기준 및 방법을 정하고, 국민과 의료제공자에게 이를 준수하도록 하고 있다.

② 가족예방접종 : 국가예방접종 이외 민간 유통기堰에서 접종 가능한 예방접종

③ DTaP : 성인 4주 이내 접종

④ B형간염 : 양성부위 B형간염 항원(HBsAg) 양성이 경우에는 출생 후 12시간 이내 B형간염 면역글로불린(HBIG) 및 B형간염 백신을 동시에 접종하고, 이후의 B형간염 접종일정은 출생 후 1개월 및 6개월에 2차, 3차 접종 실시

⑤ DTaP(디프테리아·파상풍·백일해) : DTaP-IPV(디프테리아·파상풍·백일해·풀리오) 혼합백신으로 접종 가능

⑥ Td / Tdap : 만 1~12세에 TD 또는 Tdap으로 수가 접종

⑦ 풀리오 : 3차 접종 후 6개월에 접종하거나 18개월까지 접종 가능하여, DTaP-IPV(디프테리아·파상풍·백일해·풀리오) 혼합백신으로 접종 가능

⑧ DTaP-IPV(디프테리아·파상풍·백일해·풀리오) : 생후 2, 4, 6개월, 1~6세에 DTaP, IPV 백신 대신 DTaP-IPV 혼합백신으로 접종할 수 있음. 이 경우 기초3회는 등밀 제조조사의 백신으로 접종하는 것이 원칙이며, 생후 15~18개월에 접종하는 DTaP 백신은 제조조사 관계없이 선택하여 접종 가능

⑨ 노령 예방접종 인플루엔자(Hib) : 생후 2개월~5세 미만 모든 소아를 대상으로 접종. 5세 이상은 b형 세オ필루스 인플루엔자균 감염 위험성이 높은 경우(경상체포구증, 비급 접종 후, 항암치료에 따른 면역 저하, 박테리아, HV 감염, 세력학적 질환 등) 접종

⑩ 폐렴구균(안락열병) : 10개와 13개 단백질합 백신 간에 고려접종은 권장하지 않음

⑪ 폐렴구균(생식성) : 2세 이하의 폐렴구균 감염의 고위험군을 대상으로 하여 건강상태를 고려하여 담당의사와 충분한 상담 후 접종

⑫ 폐렴구균 감염의 고위험군

- 연세 기준이 제외된 소아 : HIV 감염증, 만성 신부전과 신증후군, 면역억제제나 방사선 치료를 하는 질환(악성 종양, 박테리아, 토크, 호치킨病) 혹은 경기 악화, 선천성 면역결핍증

- 기능적 또는 세력학적 위험군 소아 : 당뇨구 7세 혹은 세포호르몬제, 무비온 혹은 비정 기능장애

- 면역 기능이 상상이나 다소나 같은 질환을 가진 소아 : 만성 질환(질환, 당뇨병, 뇌파수액 누출, 인공관수 이식 치료)

⑬ 출생 : 유경 시 생후 6~11개월에 MMR 백신 접종이 가능하나 이 경우 생후 12개월 이후에 MMR 백신 접종을 필요

⑭ A형간염 : 생후 12개월 이후에 1차 접종하고 6~18개월 후 추가접종(제조조사에 따라 접종 시기다)

⑮ 일본뇌염(사생신) : 1차 접종 후 7~10일 간격으로 2차 접종을 실시하고, 2차 접종 후 12개월 후 3차 접종.

⑯ 일본뇌염(생신) : 1차 접종 후 12개월 후 2차 접종

⑰ 사 لم부후생자(사생신) : 만 12세에 6회 접종 후 2세 접종(2회가 1기 백신 간 고려접종은 권장하지 않음)

⑱ 사 لم부후생자(생신) : 6~69개월 소아의 경우 예년 접종 실시. 이 경우 접종 첫 해에는 5개월 간격으로 2회 접종하고 이어 대신 6회 접종. 만 18개월 후 2세 접종(2회가 1기 백신 간 고려접종은 권장하지 않음)

⑲ 인플루엔자(사생신) : 6~59개월 소아의 경우 예년 접종 첫 해에는 1회만 접종하는 경우 그 다음에 1회를 간격으로 2회 접종

⑳ 인플루엔자(생신) : 24개월 이상부터 접종 가능하며, 접종 첫 해에는 1개월 간격으로 2회 접종하고 이후 예년 1회 접종. 인플루엔자 접종 첫 해에 다른 접종받은 경우 그 다음에 1개월 간격으로 2회 접종

USA

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2016.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE [FIGURE 2].)

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

| Vaccine | Birth | 1 mo | 2 mos | 4 mos | 6 mos | 9 mos | 12 mos | 15 mos | 18 mos | 19–23 mos | 2–3 yrs | 4–6 yrs | 7–10 yrs | 11–12 yrs | 13–15 yrs | 16–18 yrs | |
|---|----------------------|------------------------------|----------------------|----------------------|--|--|------------------------------|---|----------------|---|----------------------|--|----------|-----------------|-----------------|-----------|--|
| Hepatitis B ⁷ (HepB) | 1 st dose | ←···2 nd dose···→ | | | ←···3 rd dose···→ | | | | | | | | | | | | |
| Rotavirus ² (RV) RV1 (2-dose series); RV5 (3-dose series) | | | 1 st dose | 2 nd dose | See footnote 2 | | | | | | | | | | | | |
| Diphtheria, tetanus, & acellular pertussis ³ (DTaP: <7 yrs) | | | 1 st dose | 2 nd dose | 3 rd dose | | | ←···4 th dose···→ | | | | 5 th dose | | | | | |
| Haemophilus influenzae type b ⁴ (Hib) | | | 1 st dose | 2 nd dose | See footnote 4 | | | ←···3 rd or 4 th dose···→ | See footnote 4 | | | | | | | | |
| Pneumococcal conjugate ⁵ (PCV13) | | | 1 st dose | 2 nd dose | 3 rd dose | | ←···4 th dose···→ | | | | | | | | | | |
| Inactivated poliovirus ⁶ (IPV: <18 yrs) | | | 1 st dose | 2 nd dose | ←···3 rd dose···→ | | | | | | 4 th dose | | | | | | |
| Influenza ⁷ (IIV; LAIV) | | | | | | Annual vaccination (IIV only) 1 or 2 doses | | | | Annual vaccination (LAIV or IIV) 1 or 2 doses | | Annual vaccination (LAIV or IIV) 1 dose only | | | | | |
| Measles, mumps, rubella ⁴ (MMR) | | | | | See footnote 8 | ←···1 st dose···→ | | | | 2 nd dose | | | | | | | |
| Varicella ⁸ (VAR) | | | | | | ←···1 st dose···→ | | | | 2 nd dose | | | | | | | |
| Hepatitis A ¹⁰ (HepA) | | | | | ←···2-dose series, See footnote 10···→ | | | | | | | | | | | | |
| Meningococcal ¹¹ (Hib-MenCY ≥ 6 weeks; MenACWY-D ≥ 9 mos; MenACWY-CRM ≥ 2 mos) | | | See footnote 11 | | | | | | | | 1 st dose | | | | | Booster | |
| Tetanus, diphtheria, & acellular pertussis ¹² (Tdap: ≥7 yrs) | | | | | | | | | | | | | | | (Tdap) | | |
| Human papillomavirus ¹³ (2vHPV: females only; 4vHPV, 9vHPV: males and females) | | | | | | | | | | | | | | (3-dose series) | | | |
| Meningococcal B ¹¹ | | | | | | | | | | | | | | | See footnote 11 | | |
| Pneumococcal polysaccharide ⁵ (PPSV23) | | | | | | | | | | | | | | | See footnote 5 | | |

 Range of recommended ages for all children
  Range of recommended ages for catch-up immunization
  Range of recommended ages for certain high-risk groups
  Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision making
  No recommendation

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/hcp/acip-recs/index.html>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (<http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm>) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/acip>), the American Academy of Pediatrics (<http://www.aap.org>), the American Academy of Family Physicians (<http://www.aafp.org>), and the American College of Obstetricians and Gynecologists (<http://www.acog.org>).

NOTE: The above recommendations must be read along with the footnotes of this schedule.

Malaysia

Jadual Baru :

| IMUNISASI | Umur (Bulan) | | | | | | | | | | | (Tahun) | | |
|--------------|--------------|-------|-------|-------|--------------|-------|-------|----|---------|---------|------------------|---------|----|--|
| | 0 | 1 | 2 | 3 | 5 | 6 | 9 | 12 | 18 | 21 | 7 | 13 | 15 | |
| BCG | Dos 1 | | | | | | | | | | | | | |
| Hepatitis B | Dos 1 | Dos 2 | | | | Dos 3 | | | | | | | | |
| DTaP | | | Dos 1 | Dos 2 | Dos 3 | | | | Booster | | | | | |
| Hib | | | Dos 1 | Dos 2 | Dos 3 | | | | Booster | | | | | |
| Polio (IPV) | | | Dos 1 | Dos 2 | Dos 3 | | | | Booster | | | | | |
| Measles | | | | | Sabah sahaja | | | | | | | | | |
| MMR | | | | | | Dos 1 | Dos 2 | | | | | | | |
| MR | | | | | | | | | | Booster | | | | |
| DT | | | | | | | | | | Booster | | | | |
| OPV | | | | | | | | | | | | | | |
| HPV | | | | | | | | | | | Perempuan sahaja | | | |
| Tetanus | | | | | | | | | | | | Booster | | |
| JE (Sarawak) | | | | | | Dos 1 | | | Dos 2 | | | | | |

*Jadual baru Imunisasi MMR digunakan
bermula tahun 2016*



IAP VACCINATION SCHEDULE

IAP recommended vaccines for routine use

| Age (completed weeks/ months/years) | Vaccines | Comments |
|---|---|--|
| Birth | BCG OPV 0 Hep-B 1 | Administer these vaccines to all newborns before hospital discharge |
| 6 weeks | DTaP 1 IPV 1 Hep-B 2 Hib 1 Rotavirus 1 PCV 1 | <p>DTaP:</p> <ul style="list-style-type: none"> DTaP vaccine combinations should preferably be avoided for the primary series DTaP vaccine combinations should be preferred in certain specific circumstances/ conditions only No need of repeating/giving additional doses of whole-cell pertussis (wP) vaccine to a child who has earlier completed their primary schedule with acellular pertussis (aP) vaccine-containing products. <p>Polio:</p> <p>All doses of IPV may be replaced with OPV if administration of the former is unfeasible.</p> <ul style="list-style-type: none"> Additional doses of OPV on all supplementary immunization activities (SIAs) Two doses of IPV instead of 3 for primary series if started at 8 weeks, and 8 weeks interval between the doses No child should leave the facility without polio immunization (IPV or OPV), if indicated by the schedule |
| 10 weeks | DTaP 2 IPV 2 Hib 2 *Rotavirus 2 PCV 2 | <p>Rotavirus:</p> <p>If RV1 is chosen, the first dose should be given at 10 weeks</p> |
| 14 weeks | DTaP 3 IPV 3 Hib 3 *Rotavirus 3 PCV 3 | <p>Rotavirus:</p> <ul style="list-style-type: none"> Only 2 doses of RV1 are recommended at present. If RV1 is chosen, the 2nd dose should be given at 14 weeks. |
| 6 months | OPV 1 Hep-B 3 | <p>Hepatitis-B: The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks and at least 16 weeks after the first dose.</p> <p>MMR:</p> <p>Measles-containing vaccine ideally should not be administered before completing 270 days or 9 months of life;</p> <p>The 2nd dose must follow in 2nd year of life; No need to give stand-alone measles vaccine</p> |
| 9 months | OPV 2 MMR 1 | <ul style="list-style-type: none"> Currently, two typhoid conjugate vaccines, Typhi-TCV® and PedaTyph® available in Indian market; PedaTyph® is not yet approved; the recommendation is applicable to Typhi-TCV® only <p>An interval of at least 4 weeks with the MMR vaccine should be maintained while administering this vaccine.</p> <p>Should follow a booster at 2 years of age</p> |
| 9-12 months | Typhoid Conjugate Vaccine | |

| Age (completed weeks/ months/years) | Vaccines | Comments |
|---|---|---|
| 12 months | Hep-A 1 | <p>Hepatitis A:</p> <p>Single dose for live attenuated H2-strain Hep-A vaccine Two doses for all killed Hep-A vaccines are recommended now</p> |
| 15 months | MMR 2 Varicella 1 PCV booster | <p>MMR:</p> <p>The 2nd dose must follow in 2nd year of life However, it can be given at anytime 4-8 weeks after the 1st dose</p> <p>Varicella: The risk of breakthrough varicella is lower if given 15 months onwards</p> |
| 16 to 18 months | DTaP B1/DTaP B1 IPV B1 Hib B1 | <p>The first booster (4th dose) may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.</p> <p>DTaP:</p> <p>First & second boosters should preferably be of DTaP Considering a higher reactogenicity of DTaP, DtaP can be considered for the boosters</p> |
| 18 months | Hep-A 2 | <p>Hepatitis A: 2nd dose for killed vaccines; only single dose for live attenuated H2-strain vaccine</p> |
| 2 years | Typhoid booster | <p>Either Typhi-TCV® or Vi-polysaccharide (Vi-PS) can be employed as booster; Typhoid revaccination every 3 years, if Vi- polysaccharide vaccine is used Need of revaccination following a booster of Typhi-TCV® not yet determined</p> |
| 4 to 6 years | DTaP B2/DTaP B2 OPV 3 Varicella 2 Typhoid booster | <p>Varicella: the 2nd dose can be given at anytime 3 months after the 1st dose.</p> |
| 10 to 12 years | Tdap/Td HPV | <p>Tdap: is preferred to Td followed by Td every 10 years. HPV: Only 2 doses of either of the two HPV vaccines for adolescent/preadolescent girls aged 9-14 years;</p> <p>For girls 15 years and older, and immunocompromised individuals 3 doses are recommended</p> <p>For two-dose schedule, the minimum interval between doses should be 6 months.</p> <p>For 3 dose schedule, the doses can be administered at 0, 1-2 (depending on brands) and 6 months</p> |

INDIA



KSA

| جدول التطعيمات الأساسية | | | |
|-------------------------|---|---|-------------|
| Visit | Vaccine | اللقاء | الزيارة |
| At Birth | BOG HepB | الدرن الإنتهاك الكبدي (ب) | الولادة |
| 2 months | IPV (DRP , HepB , Hib) | شلل الأطفال المعطل (الثلاثي البكتيري : الإنتهاك الكبدي (ب) : المستدمية النزلية) | شهران |
| 4 months | OPV (DRP , HepB , Hib) | شلل الأطفال القموي (الثلاثي البكتيري : الإنتهاك الكبدي (ب) : المستدمية النزلية) | 4 أشهر |
| 6 months | OPV (DRP , HepB , Hib) | شلل الأطفال القموي (الثلاثي البكتيري : الإنتهاك الكبدي (ب) : المستدمية النزلية) | 6 شهور |
| 9 months | Measles (mono) | المحصبة المفرد | 9 شهور |
| 12 months | OPV | شلل الأطفال القموي | 12 شهر |
| | MMR Varicella | الثلاثي الفيروسي الجدري المائي | |
| 18 months | OPV (DTP , Hib) Hepatitis (A) | شلل الأطفال القموي (الثلاثي البكتيري : المستدمية النزلية) الإنتهاك الكبدي (أ) | 18 شهر |
| 24 months | Hepatitis (A) | الإنتهاك الكبدي (أ) | 24 شهر |
| 4-6 years | OPV | شلل الأطفال القموي | 4 - 6 سنوات |
| | DTP | الثلاثي البكتيري | |
| | MMR | الثلاثي الفيروسي | |
| | Varicella | الجدري المائي | |

TERIMA KASIH