HIV ve Aşılar

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KLİMİK-EBÇG

Rutin aşı önerileri: **ACIP**

Covid-19
Influenza (inaktive-rekombinant)
Tdap/ td
Zona zoster (Rekombinant)
Pnömokok
Hepatit A
Hepatit B
Polio (İnaktif)
MenACWY
KKK (CD4 sayısı)
Su çiçeği (CD4 sayısı)

HPV
Mpox
RSV

Table 2 Recommended Adult Immunization Schedule by Medical Condition or Other Indication, United States, 2025

Always use this table in conjunction with Table 1 and the Notes that follow. Medical conditions or indications are often not mutually exclusive. If multiple medical conditions or indications are present, refer to guidance in all relevant columns. See Notes for medical conditions or indications not listed.

VACCINE	Pregnancy	Immunocompromised (excluding HIV infection)	HIV infection CD4 percentage and count: <15% or <200mm³	HIV infection CD4 percentage and count: ≥15% and ≥200mm³	Men who have sex with men	Asplenia, complement deficiency	Heart or lung disease	Kidney failure, End-stage renal disease or on dialysis	Chronic liver disease; alcoholism[a]	Diabetes	Health care Personnel[b]
COVID-19		See Notes									
Influenza inactivated Influenza recombinant		Solid organ transplant (See Notes)			1 dose annually						
LAIV3					1 dose annually if age 19–49 years		1 dose annually if age 19–49 years				
RSV	Seasonal administration (See Notes)	See Notes				See Notes			Liver disease (See Notes)	See Notes	
Tdap or Td	Tdap: 1 dose each pregnancy	1 dose Tdap, then Td or Tdap booster every 10 years									
MMR	•										
VAR	•			See Notes							
RZV		See Notes									
HPV	•	3-dose series if indicated									
Pneumococcal											
HepA											
Hep B	See Notes									Age ≥ 60 years	
MenACWY											
MenB											
Hib		HSCT: 3 doses[c]				Asplenia: 1 dose					
Mpox	See Notes				See Notes						See Notes
IPV		Complete 3-dose series if incompletely vaccinated. Self-report of previous doses acceptable (See Notes)									

Recommended for all adults who lack documentation of vaccination, OR lack evidence of immunity

Not recommended for all adults, but recommended for some adults based on either age OR increased risk for or severe outcomes from disease

Recommended vaccination based on shared clinical decision-making

Recommended for all adults, and additional doses may be necessary based on medical condition or other indications. See Notes

Precaution: Might be indicated if benefit of protection outweighs risk of adverse reaction

Contraindicated or not recommended *Vaccinate after pregnancy, if indicated

No Guidance/ Not Applicable

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents With HIV

(14 Temmuz 2025 son güncelleme)

Covid-19
İnfluenza (inaktive-recombinant)
Tdap/ td
Pnömokok
Hepatit A
Hepatit B
MenACWY
KKK (CD4 sayısı)
Su çiçeği (CD4 sayısı)
HPV

MenB
Mpox (MVA-BN attenue)
RSV

Recommended Immunization Schedule for Adults and Adolescents With HIV

Vaccine	All People With HIV	Where Varies by Age	Where Varies by Pregnancy Status	Where Varies by CD4 Cell Count (cells/mm3)	
				<200	≥200
COVID-19	For current COVID-19 vaccination recommendations, please visit the CDC's COVID-19 Vaccines website.			Recommendations differ with advanced or untreated HIV infection	
Hepatitis A (HepA, HepA-HepB)	Two to three doses (varies by formulation)				
Hepatitis B (HepBCpG, HepB, HepA-HepB)	Two to three doses (varies by formulation and indication)				
Human Papillomavirus (HPV)		Three doses for ages 18–26 years Consider for ages 27–45 years with shared decision-making	Not recommended during pregnancy		
Influenza (Multiple Vaccines)	One dose annually				
Measles, Mumps, Rubella (MMR)			Not recommended during pregnancy	Contraindicated	Two doses if born after 1956 and no history of vaccination or positive antibody titer
Meningococcal A, C, W, Y Conjugate (MenACWY)	Three doses				
Meningococcal B (MenB)	Three doses		Not recommended during pregnancy		
Mpox (MVA-BN, Attenuated)	Two doses	Subcutaneous route preferred for people aged <18 years	Shared decision-making		
Pneumococcal Conjugate (PCV15, PCV20, PCV21)	One dose				
Pneumococcal Polysaccharide (PPSV23)	One dose (if conjugate vaccine was PCV-15)				
Respiratory Syncytial Virus (RSV)		One dose for people aged ≥75 years or those aged 60–74 years with a comorbid condition that increases risk for severe RSV disease	One dose between 32 and 36 weeks gestation		
Tetanus, Diphtheria, Pertussis (Tdap/Td)	Tdap once, then Td or Tdap booster every 10 years		Recommend booster with each pregnancy		
Varicella (VAR)			Not recommended in pregnancy	Contraindicated	Two doses
Zoster Recombinant (RZV)		Two doses for people aged ≥18 years	Not recommended in pregnancy		

Recommended for all adults and adolescents with HIV who meet the age requirement or lack documentation of vaccination or evidence of past infection.

Recommended for adults and adolescents with HIV with another risk factor (medical, occupational, or other indication) or in select circumstances.

Contraindicated

Note: Recommendations may differ from the Advisory Committee on Immunization Practices.

Guidelines for the Prevention and Treatment of Opportunistic Infections in Adults and Adolescents With HIV R-35

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

Rutin aşı önerileri: EASC

Covid-19
İnfluenza (inaktive-recombinant)
Pnömokok
Hepatit A
Hepatit B
MenACWY
MenB (Ulusal önerilere göre)
KKK (CD4 sayısı)
Su çiçeği (CD4 sayısı)
Zona zoster
HPV
Mpox (Risk değerlendirme)
Sarı humma (Seyahat)
Kuduz (Risk değerlendirme)

Infection	Vaccination rationale	Comment
Influenza Virus	Higher rate of pneumonia. Explicitly recommended in all persons with HIV	Yearly, use 4-valent vaccine if available
Human Papilloma Virus (HPV)	Shared risk with HIV of contracting infection. Higher rate of cervical and anal cancer	Vaccinate with 3 doses between ages 9 and 45 (health insurance coverage differs by country according to age, sex, sexual orientation). Use 9-valent vaccine if available. Persons treated for high grade dysplasia could benefit from a full course vaccination for secondary prevention
Hepatitis B Virus (HBV)	Shared risk with HIV of contracting infection. Untreated HIV accelerates progression of liver disease	Vaccinate if seronegative. Repeat doses until anti-HBs antibodies ≥ 10 IU/L / ≥ 100 IU/L according to national Guidelines. In order to reach ≥ 100 IU/L in non-responders repeat 3 doses if anti-HBs < 10 IU/L, 1 dose if anti-HBs < 100 IU;[m] consider double dose (40 µg) or use more immunogenic vaccines in particular with low CD4 count and high HIV VL. No benefit for intradermal application. See page 127
Hepatitis A Virus (HAV)	According to risk profile (travel, close contact with children, MSM, IVDU, active hepatitis B or C infection, chronic liver disease)	Vaccinate if seronegative. Consider checking antibody titres in persons at high risk. Weaker immune response expected with HAV/HBV co-vaccine. See page 127
Neisseria meningitidis	According to risk profile (travel, close contact with children, MSM)	Use conjugated[n] 4-valent vaccine (for serotypes A, C, W-135, Y; 2 doses 1-2 months apart) if available. Booster every five years if exposure continues. Polysaccharide vaccine no longer recommended. Vaccinate against Meningococcus serotype B according to national guidelines
Streptococcus pneumoniae	Higher rate and severity of invasive disease. Vaccine explicitly recommended for all persons with HIV	One dose of a conjugated vaccine: PCV-13, PCV-15 or PCV-20a for all persons according to availability and national guidelines, also if pre-vaccinated with PPV-23 polysaccharide vaccine. For patients vaccinated with PCV-13 or PCV-15, one dose of PPV-23 at least 2 months after the conjugate vaccine may be considered in some national guidelines for all persons with HIV
Varicella Zoster Virus (VZV)	Higher rate and severity of both chickenpox and zoster	Perform serology if exposure history negative. Vaccinate if seronegative. For contraindications, see*. To prevent shingles, preferably use adjuvant recombinant sub-unit vaccine over live-attenuated vaccine according to national guidelines
Yellow Fever Virus	Mandatory for travel to selected countries (provide exemption letter if no true risk of exposure)	Contraindicated if past or current haematological neoplasia or thymus affection (thymoma, resection/radiation) For other contraindications, see*. Booster every 10 years
Rabies		If pre-exposure rabies vaccination is administered in persons with CD4 ≥ 200 cells/µL, 2-dose (days 0 and 7) IM schedule is recommended. For persons with CD4 count <200 cells/µL or detectable viremia, consider pre-exposure vaccination with 3 doses (0, 7, 21 or 28 days) and antibody titre measurement 14 days later. In case of rabies postexposure prophylaxis (PEP) in unvaccinated persons, perform immediate wound cleaning, infiltration of human rabies immunoglobulin (HRIG) within and around the wound and days 0, 3, 7 and 14 IM administration of rabies vaccine in people with HIV with CD4≥200 cells/µL. In people with HIV with CD4 <200 cells/µL or detectable viremia, PEP should comprise a 5-dose vaccination regimen (days 0, 3, 7, 14, and 28), with one dose of HRIG and additional vaccine dose is recommended if rabies serology demonstrates inadequate titers during the follow-up (antibody levels <0.5 IU/mL). In vaccinated people with HIV, the PEP recommendation for a 2/3-dose vaccination series has not changed

https://www.eacsociety.org/media/guidelines-12.0.pdf

Rutin aşı önerileri: HIV/AIDS tanı, tedavi ve izlem el kitabı

Covid-19
İnfluenza (inaktive-rekombinant)
Pnömokok
Hepatit A
Hepatit B
Meningokok
KKK (CD4 sayısı)
Su çiçeği (CD4 sayısı)
HPV
Tdap ve/veya td
Kuduz (Ulusal rehber önerileri)
Sarı Humma (seyahat)

Tablo 3.4. HIV ile yaşayan erişkin bireylere önerilen aşılar

Enfeksiyon	Doz sayısı	Endikasyon	Öneriler
Hepatit A	2	Bağışık olmayan kişiler	CD4 T lenfositi sayısı <350 hücre/mm³ ise 3 doz önerilir
Hepatit B	3	Bağışık olmayan kişiler	Aşıya yanıt vermeyenlerde, özellikle CD4 T lenfositi düzeyi düşük, viremisi yüksek olanlarda çift doz (40 µg) aşılama önerilir. Ulusal kılavuzlara göre, anti-HBs titresi ≥ 10 IU/L / ≥ 100 IU/L oluncaya dek dozların tekrarlanması önerilir.
İnsan papilloma virüsü (HPV)	3	9 ve 45 yaş arasındaki HIV(+) tüm bireyler	9 valanslı aşı önerilir. HPV enfeksiyonu gelişmişse, aşının etkinliği tartışmalıdır[a]
İnfluenza	Yıllık	HIV (+) tüm bireyler	İnaktif aşı kullanılır; intranazal canlı atenüe aşı kontraendikedir. 4 valanslı aşı önerilir.
Meningokok	2	Genel toplum ile aynı	Mümkünse konjuge aşı kullanılmalıdır; polisakkarit aşı önerilmemektedir. Temas devam ediyorsa her beş yılda bir rapel uygulanabilir.
Pnömokok	2	HIV (+) tüm bireyler	Kişi PPV-23 polisakkarit aşısı ile önceden aşılanmışsa, tüm bireyler için bir doz konjüge KPV-13 aşı önerilir. Rapel doz için bir öneri yoktur. Tüm bireyler için KPV-13 aşısından en az 2 ay sonra bir doz PPV-23 aşısı yapılması önerilir.
Suçiçeği	2	Bağışık olmayan kişiler	CD4 T lenfositi sayısı >200 hücre/mm³ olduğunda aşılama önerilir[b,c]
Kızamık, kızamıkçık, kabakulak (KKK)	2	Bağışık olmayan kişiler	CD4 T lenfositi sayısı >200 hücre/mm³ olduğunda aşılama önerilir.
Boğmaca	1	Gebelik	dTaP/IPV olarak kombine aşı önerilir. Tüm bireylere dTaP aşısının erişkin yaşta bir kez yapılması önerilmektedir.
Tetanoz - Difteri	1	Yaralanma	Td için ulusal aşı rehberindeki öneriler geçerlidir. On yılda bir rapel yapılmalıdır.
Kuduz	5	Temastan sonra	Ulusal aşı rehberindeki öneriler geçerlidir.
Sarı humma	1	Seyahat halinde	<60 yaş ve CD4 T lenfositi sayısı >200 hücre/mm³ olduğunda aşılama önerilir. Geçirilmiş hematolojik neoplazi veya timüsün etkilendiği durumlarda (timoma, rezeksiyon/ radyasyon) kontrendikedir.
COVID-19 (SARS-CoV-2) enfeksiyonu		HIV (+) tüm bireyler	CD4T lenfositi sayısı ve HIV RNA düzeyinden bağımsız olarak tüm bireylerin ulusal aşı rehberi önerilerine uygun doz ve şemada aşılanması önerilir.

Birlikte aşı uygulamaları

TABLE 3-4. Guidelines for spacing of live and non-live antigens	
Antigen combination	**Recommended minimum interval between doses**
Two or more non-live [a],[b],[c]	May be administered simultaneously or at any interval between doses
Non-live and live [d]	May be administered simultaneously or at any interval between doses
Two or more live injectable [d]	28 days minimum interval, if not administered simultaneously

https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/downloads/general-recs.pdf

Birlikte aşı uygulamaları

HIV ile yaşayan bireyler ve splenektomi

Konguge pnömokok (KPA7, KPA13, KPA20)
ve
Meningokok (MenACWY-D - Menectra)

Difteri toksoid proteini

Bazı pnömokok serotiplerine
(Serogrup 4, 6b, 18c) antikor yanıtında azalma

Önce KPA, 28 gün sonra MenACWY-D

Konjuge pnömokok aşısı
(KPA13 veya KPA15)
ve
Polisakkarid aşı (PPA23)

Önce KPA, 8 hafta sonrasında ise PPA23

Hepatit B aşıları

Seronegatif

İzole anti-HBc pozitif,

Mümkünse erken aşılama
(CD4 > 350 mm^3)

Adjuvanlı rekombinat aşı (0-4 hafta)
(Ulaşılır değil)

Rekombinant aşı
(yüksek doz 40 mcg)-0,1,6 ay

Hepatit B-A Kombine aşı-0,1,6 ay

İzole anti-HBc pozitif

Tek standart doz rekombinant aşı

Anti-HBs > 100 mIU/mL - ek doz yok)
Anti-HBs < 100 mIU/mL- 3 doz

Yüksek viral yük ve düşük CD4 sayısı olanlarda **yüksek doz veya immünojenik aşıları** değerlendirin!

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.eacsociety.org/media/guidelines-12.0.pdf

Hepatit B aşıları

Vaccine Preventable Infection	Indication	Recommendations	Additional Comments	ACIP Recommendations
Hepatitis B Virus (HBV)	HBV nonimmune and no active HBV (i.e., negative for HBsAg, anti-HBc, and anti-HBs)	Preferred: • Heplisav-B IM at 0 and 4 weeks **(AII)** Alternative (if Heplisav-B is unavailable): • Engerix-B (40 mcg): three-dose series (0, 1, 6 months) **(AII)**; *or* • Recombivax HB (20 mcg): three-dose series (0, 1, 6 months) **(AII)**; *or* • Twinrix 1.0 mL IM: three-dose series (0, 1, 6 months) **(AII)**	Anti-HBs should be obtained 4 weeks after completion of the vaccine series to document response to HepB vaccination, defined as anti-HBs ≥10 mIU/mL **(AII)**. Vaccinate individuals with isolated anti-HBc with one standard dose of HepB **(BII)** and check anti-HBs titers 1–2 months afterward. If anti-HBs ≥100 mIU/mL, no further vaccination is needed, but if the titer is <100 mIU/mL, then vaccinate with a complete series of HepB (double dose) followed by anti-HBs testing **(BII)**. If titers are not available, then give a complete vaccine series followed by anti-HBs testing **(BII)**. If a significant delay occurs between doses, there is no need to restart the series. For travelers, some clinicians recommend an accelerated schedule: • Twinrix: four-dose series (0, 7, 21–30 days, 12 months) **(BII)** Some experts consider that a four-dose vaccine series of recombinant HepB vaccine (Engerix-B 40 mcg or Recombivax HB 20 mcg at 0, 1, 2, and 6 months) may produce a better immunologic response, but this approach has not been demonstrated to be superior to a double-dose, three-dose series.	ACIP does not recommend the use of double-dose Engerix-B or Recombivax HB high-dose for people with HIV.
	Vaccine nonresponder (if anti-HBs <10 mIU/mL after complete series)	If failed prior Engerix-B or Recombivax HB: • Heplisav-B IM at 0 and 4 weeks **(AI)** with consideration for third dose of HepBCpG at 24 weeks **(BIII)** If failed two-dose Heplisav-B, there are no data but can consider: • Third dose of Heplisav-B IM at 24 weeks after first dose **(BIII)**			
	Post-exposure prophylaxis	For exposed people who have been previously vaccinated with a complete series and have documented antibody response, no additional vaccine is needed.		

Special situations

- **Patients on dialysis:** complete a 3- or 4-dose series
  - 3-dose series Recombivax HB at 0, 1, 6 months (Note: Use Dialysis Formulation 1 mL = 40 mcg)
  - 4-dose series Engerix–B at 0, 1, 2, and 6 months (Note: Use 2 mL dose instead of the normal adult dose of 1 mL)
- **Age 20 years or older with an immunocompromising condition:** complete a 2- or 3- or 4-dose series.
  - 3-dose series Recombivax HB at 0,1, 6 months (Note: Use Dialysis Formulation 1ml = 40 mcg)
  - 4-dose series Engerix–B at 0,1,2, and 6 months (Note: Use 2mL dose instead of the normal adult dose of 1mL)
  - 2-doses series Heplisav–B at 0, 1 months
  - 3-dose series PreHevbrio* at 0,1, 6 months

Aşılamada başarısızlık: Adjuvanlı rekombinant aşılar (0,4, ± 24 hafta)

Viral supresyon ve CD4 sayısındaki yükselme sonrası yüksek doz (40mcg),3 veya 4 dozluk seri

Seronegatiflik

Yüksek doz veya adjuvanlı aşı

3 doz

Hedef antikor:> 100 UI/L

Okült Hepatitlerde aşılama

CD4 sayısının aşı yanıtlarına etkisi

Antikor yanıtına göre yeniden aşılama

	BHIVA [22,25]	EACS [24]	NIH [23]	SIMIT [27]	WHO [26]
Who to vaccinate?	All if seronegative	All if seronegative	All if seronegative	All if seronegative	All if seronegative
Type of vaccine and doses	Yeast-based: 40 µg Adjuvanted: 20 µg Four doses: 0, 1, 2, 6 months	According to national guidelines	Yeast-based: 40µg Adjuvanted: 20 µg Three doses	Yeast-based: 40 µg Adjuvanted (preferred): 20 µg Three doses	Suggest using double doses
Target IgG	>100 UI/L 8 weeks after the last doses	>100 UI/L	≥10 mIU/mL 8 weeks after the last doses	>100 UI/L	>100 UI/L
Occult HBV*	One dose; check HBsAb two weeks later; if HBsAg < 10 IU/L, offer full vaccination	NP	NP	One dose; check HBsAb two weeks later; if HBsAg < 10 IU/L, offer full vaccination	NP
Differences for people with low CD4/mm^3	No differences in doses; repeat HBsAb screening more frequently if CD4 cell/mm^3 < 350	For people with "particularly low CD4", consider a double dose (40 µg) or use a more immunogenetic vaccine	No difference in doses. For non-responder people with CD4/mm^3 < 200: delay re-vaccination until CD4 > 200/mm^3	No difference in doses. For non-responder people with CD4/mm^3 < 500: delay re-vaccination until CD4 > 500/mm^3	NP
Boosting	People with HBsAg < 10 UI/L: three more doses People with HBsAg < 100 UI/L but >10 UI/L: one dose	People with HBsAg < 10 UI/L: three more doses People with HBsAg < 100 UI/L but >10 UI/L: one dose	Non-responder: revaccinate with 3–4 doses For people whose HBsAg level fall below 10 UI/L: one dose if not receiving tenofovir-based regimen	People with HBsAg < 10 UI/L: three more doses People with HBsAg < 100 UI/L but >10 UI/L: one dose	People with HBsAg < 10 UI/L: three more doses People with HBsAg < 100 UI/L but >10 UI/L: one dose

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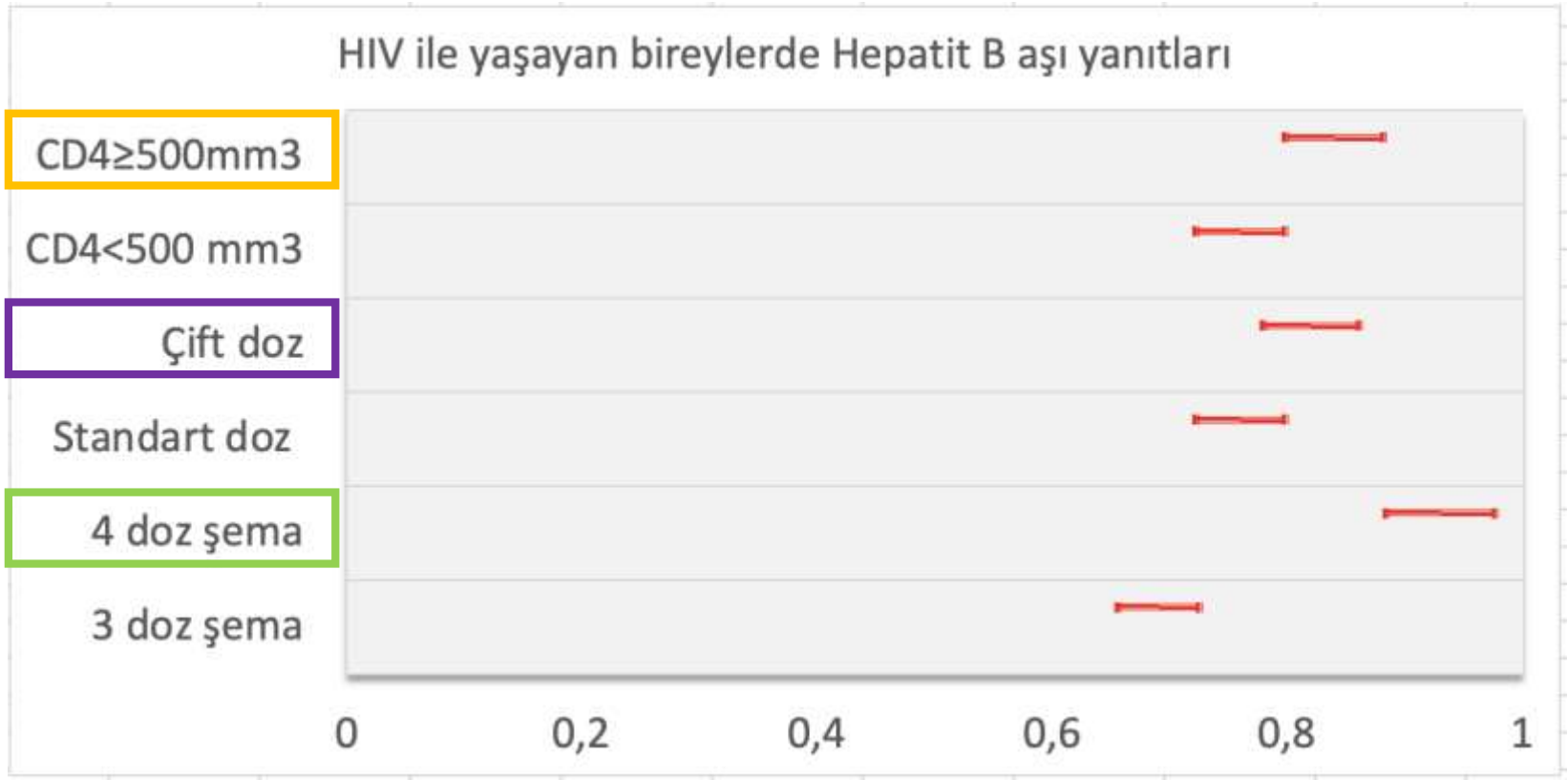
Hepatit B aşıları

7 RKÇ, 10 prospektif-gözlemsel çalışma

Meta-analiz

n=1821



Hepatit A aşıları

Seronegatif

Tek antijen içeren aşı - 0, 6-12 ay

Hepatit A-B Kombine aşı - 0,1,6 ay

Seyahat öncesi 4 doz hızlandırılmış rejim önerilebilir
0,7,21-30 gün ve 12.ay

Aşı sonrası 1-2 ay serolojik değerlendirme

CD4 ≥200/mm3,aşı yanıtı yok: 3.doz uygulanabilir

CD4 <200 /mm3+ Hepatit A riski var, aşı yanıtı yok: CD4 ≥ 200/mm3 olduğunda yeniden aşıla

CD4 <200 /mm3+ Hepatit A riski yok: Aşılama için CD4 ≥ 200/mm3 olmasını bekle

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.eacsociety.org/media/guidelines-12.0.pdf

Risk + seronegatiflik

CD4 sayısının aşı yanıtlarına etkisi (3 doz önerisi?)

Booster doz önerisi (?)

Table 1. Comparison of five HIV guideline recommendations for the HAV vaccine administration.

	BHIVA [22,25]	EACS [24]	NIH [23]	SIMIT [27]	WHO [26]
Who to vaccine?	According to risk profile (travel, close contact with children, MSM, IVDU, active hepatitis B or C infection, chronic liver disease), and with a negative anti-HAV IgG antibodies	According to risk profile (travel, close contact with children, MSM, IVDU, active hepatitis B or C infection, chronic liver disease), and with a negative anti-HAV IgG antibodies	Any person without evidence of immunity to HAV	According to risk profile (travel, close contact with children, MSM, IVDU, active hepatitis B or C infection, chronic liver disease), and with a negative anti-HAV IgG antibodies	No specific recommendation
Difference for people with low CD4/mm^3	>350 CD4/mm^3: two vaccines doses at 0 and 6 months <350 CD4/mm^3: three vaccines doses at 0, 1, and 6 months	No	<200 CD4 with risk factors: do vaccination and check antibodies response after 1–2 months. If negative, revaccinate when CD4 are >200. <200 CD4/mm^3 without risk factors: waiting for CD4 > 200/mm^3	No	No specific recommendation
Boosting?	Every 10 years	NP	NP	The cited BHIVA's recommendation of performing a booster every 10 years in high-risk people	NP

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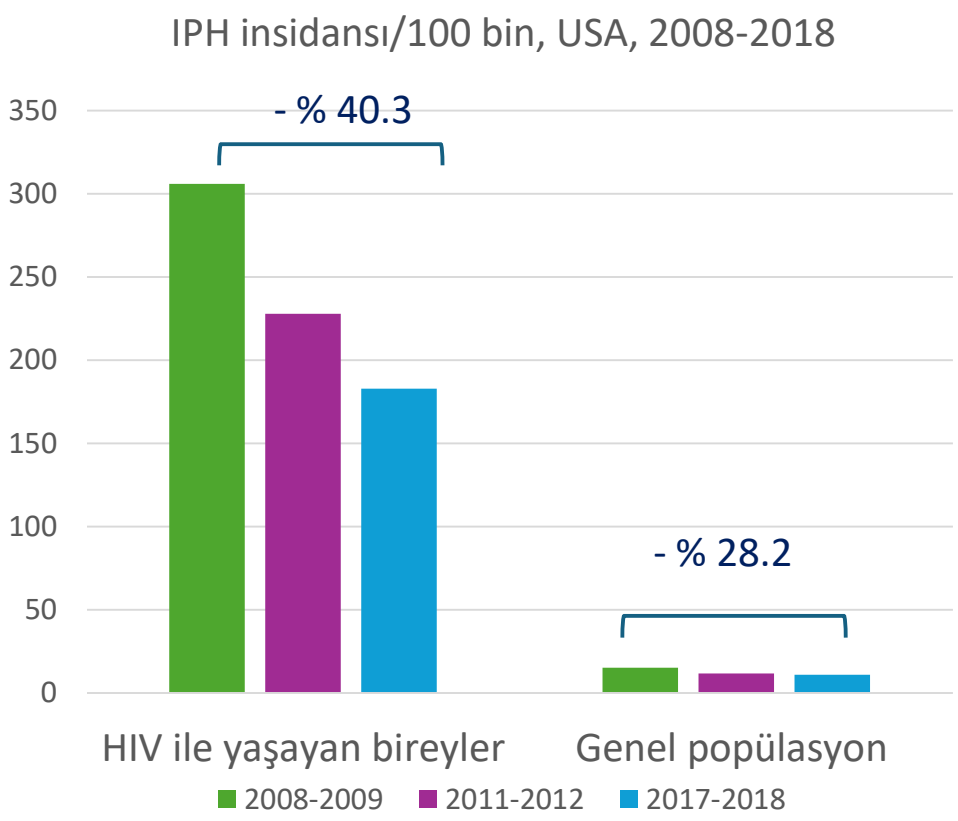
Pnömokok aşıları

Pnömokokal infeksiyon epidemiyolojisinde değişim ‘Serotip replasmanı’



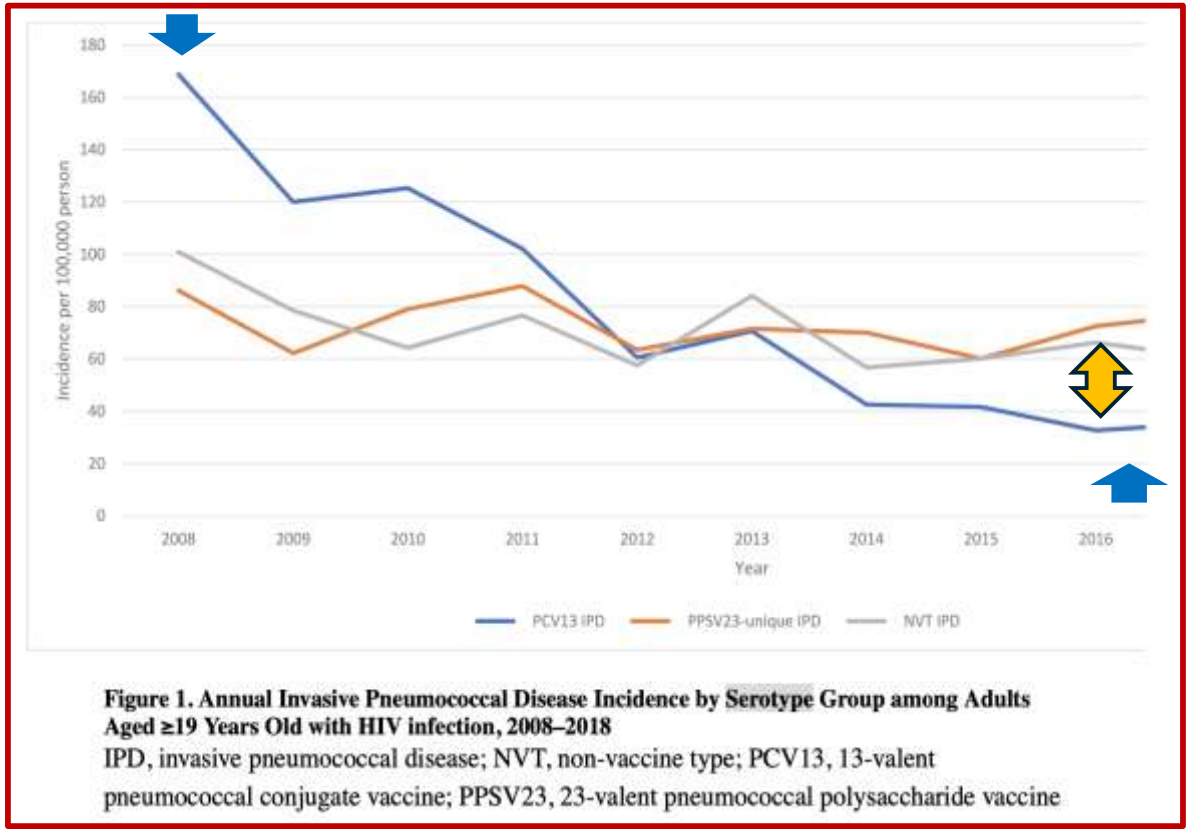


Figure 1. Annual Invasive Pneumococcal Disease Incidence by Serotype Group among Adults Aged ≥19 Years Old with HIV infection, 2008–2018

IPD, invasive pneumococcal disease; NVT, non-vaccine type; PCV13, 13-valent pneumococcal conjugate vaccine; PPSV23, 23-valent pneumococcal polysaccharide vaccine

Kobayashi et al. J Acquir Immune Defic Syndr,2022

Pnömokok aşıları

Yeni konjuge aşılar: **KPA15, KPA20,** KPA21

Polisakkarid aşı (PPA23)

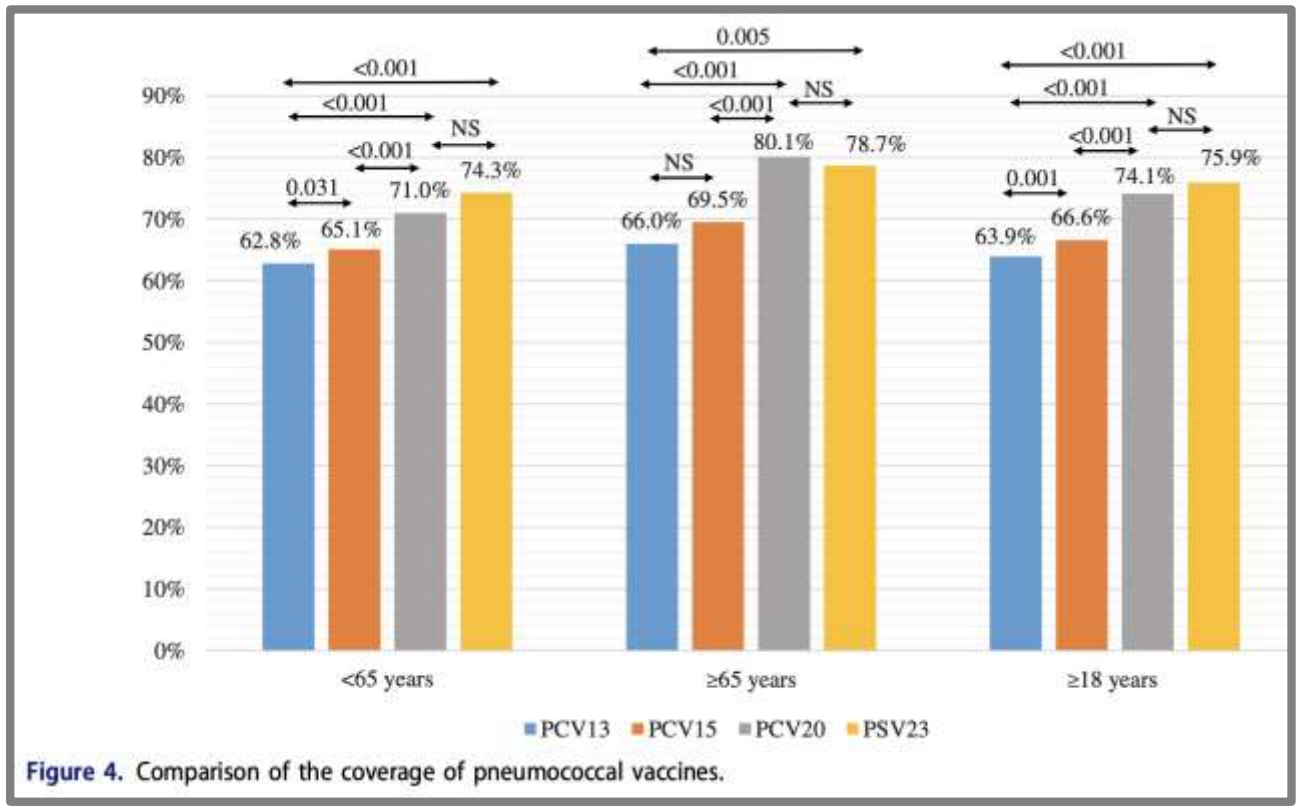


Figure 4. Comparison of the coverage of pneumococcal vaccines.

Aşı dışı serotpileri ile gelişen infeksiyonlar

Aşı serotpileri ile gelişen infeksiyonlar

(Serotip 3 ,14, 19F, 19A)

‘Ulusal sürekli veri intiyacı’

G. Hascelık Et Al. Annals Of Medicine ,2023

Pnömokok aşıları: Polisakkarid aşılar

Polisakkarid aşılar:

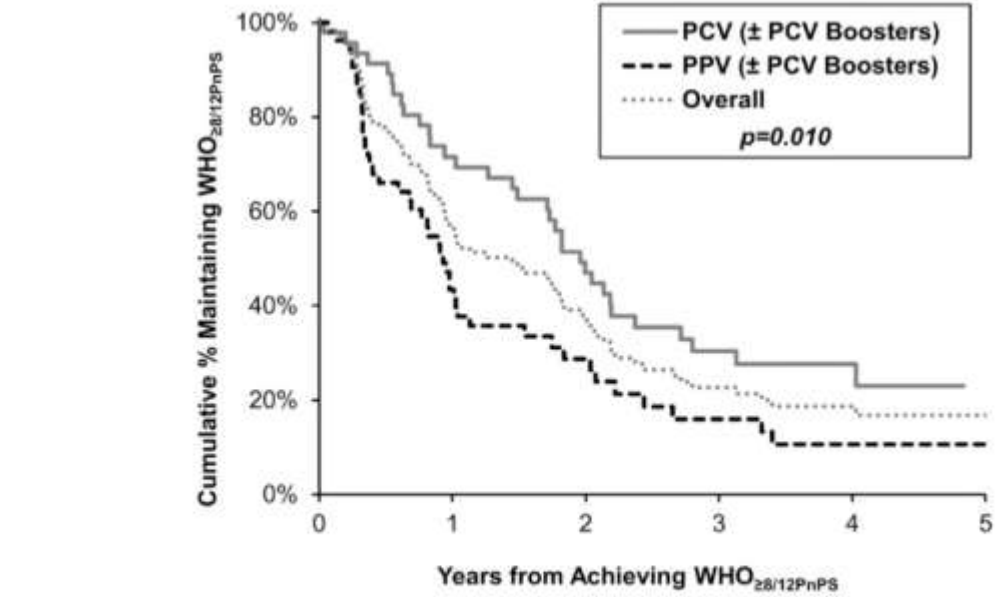
IPH için etkinlikleri devam ediyor, **zamanla azalıyor**

(≥ 5 yıl sonrasında AE % 50'den % 20-25 düşüş)

Pnömoni için etkinliği ile ilgili **farklı sonuçlar**

(2 yıl sonrasında etkinlikte anlamlı azalma, immün baskılamış hastalarda daha düşük)

Tekrar aşılamanın IPH ve pnömoni üzerine etkisi gösterilemedi.



Nakashima, K., Fukushima, W. *Hum Vaccin Immunother* **20**, 2328963 (2024)

Farrar J.E et al.*Pathogens*, *12*, 732 **2023**

Kobayashi, M. *et al. MMWR Recomm. Rep.* 72, 1–39 (2023)

K. Doherty et alVaccine 42, 2024, 126002

S.E. Faustini, Jet al. Journal of Infection, 2024

Pnömokok aşıları: Serogrup kapsayıcılığı yüksek konjuge aşılar

Previously unvaccinated	Single dose PCV 20 or PCV21
Previously vaccinated with PVC 13 or PPSV23	Single dose PCV 20 or PCV21 (1 year after the last vaccine)
Previously vaccinated with PVC 13 and PPSV23	Single dose PCV 20 or PCV21 (5 year after the last vaccine)

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

Pnömokok aşıları: PVC13+ PPV23

Clinical Infectious Diseases
MAJOR ARTICLE
IDSA
OXFORD

Long-term Immunogenicity and Boostability of the 13-valent Pneumococcal Conjugate Vaccine Followed by the 23-valent Pneumococcal Polysaccharide Vaccine in Adults Receiving Immunosuppressive Therapy and Adults With HIV—3-year Follow-up of a Prospective Cohort Study

36.ay: SPR oranı

HIV ile yaşayan bireylerde:

%44 -> %9

Immünosupresif tedavi gören hastalarda

%55 -> %17

Kontrol grubunda %82'den

% 82 ->%42

KPA13 5 yıl sonra KPA20 ile ek doz ile SPR artışı (>%70)

KPA20/KPA13 ortak serotiplerin artış var

KPA20/PPA23 ortak seroptiplerde artış yok

Serogrup kapsayıcılığı yüksek aşıların booster önerisi?

Jenny L. Schnyder et al. CID 2025:81

Meningokok aşıları

MenACWY
Daha önce aşılanmamış

MenB
Meningokok infeksiyonu için risk artışı
(Aspleni, kompleman eksikliği, kompleman inh., salgın)

MenACWY 0-2 ay arayla 2 doz, 5 yılda bir booster doz

MenB (Endikasyon varsa)
2 (0-1 ay, Bexsero) **veya 3 doz** (0-1-6 ay Trumenba) doz, 2-3 yılda bir booster doz

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

https://www.eacsociety.org/media/guidelines-12.0.pdf

Meningokok aşıları

- MenACWY-D (Menectra) ✓
- MenACWY-CRM $_{197}$ (Menveo) ✓
- MenACWY-TT (Nimenrix) ✓
- MenACWY-TT (MenQuadfi)
- MenB-Fhbp (Trumenba) ✓
- MenB-4C (Bexsero) ✓
- MenACWY-TT/MenB-FHbp

Konjuge Pnömokok aşıları birlikte kullanım önerilmez.

Önce pnömokok aşısı sonrası en az 28 gün interval önerilir

MenACWY ve Men B aşıları birlikte uygulanabilir

Risk devamında booster dozlar önerilmektedir.

-MenACWY- 5 yıl

-MenB 2-3 yıl

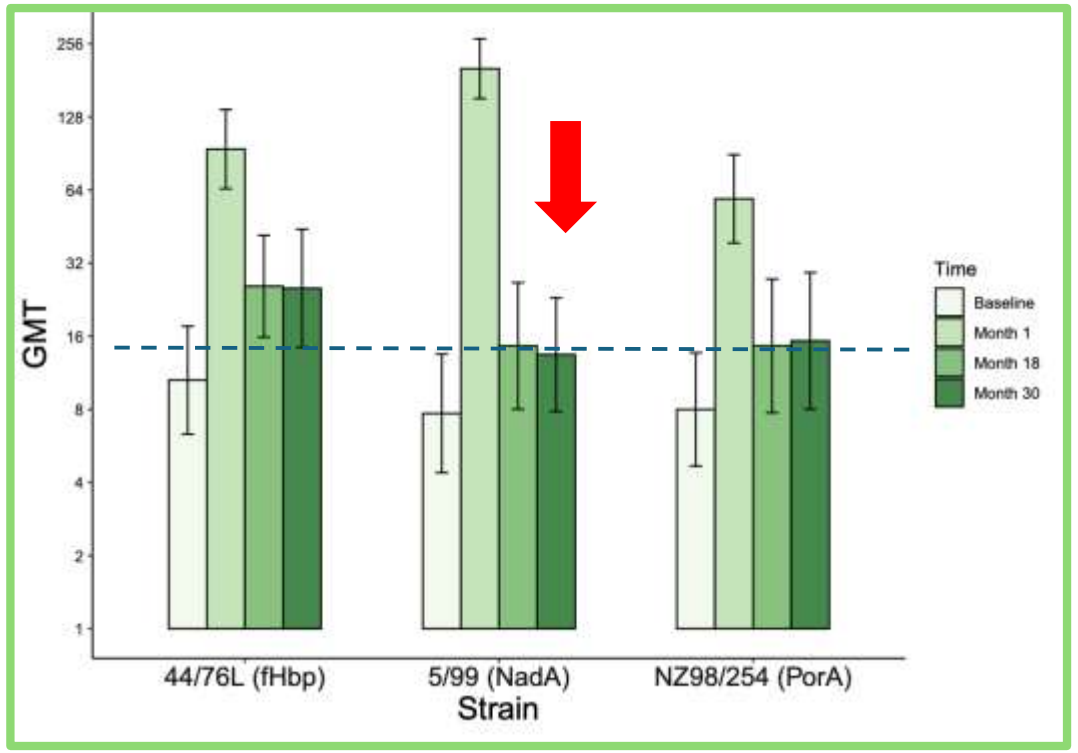
Meningococcal Vaccination: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020

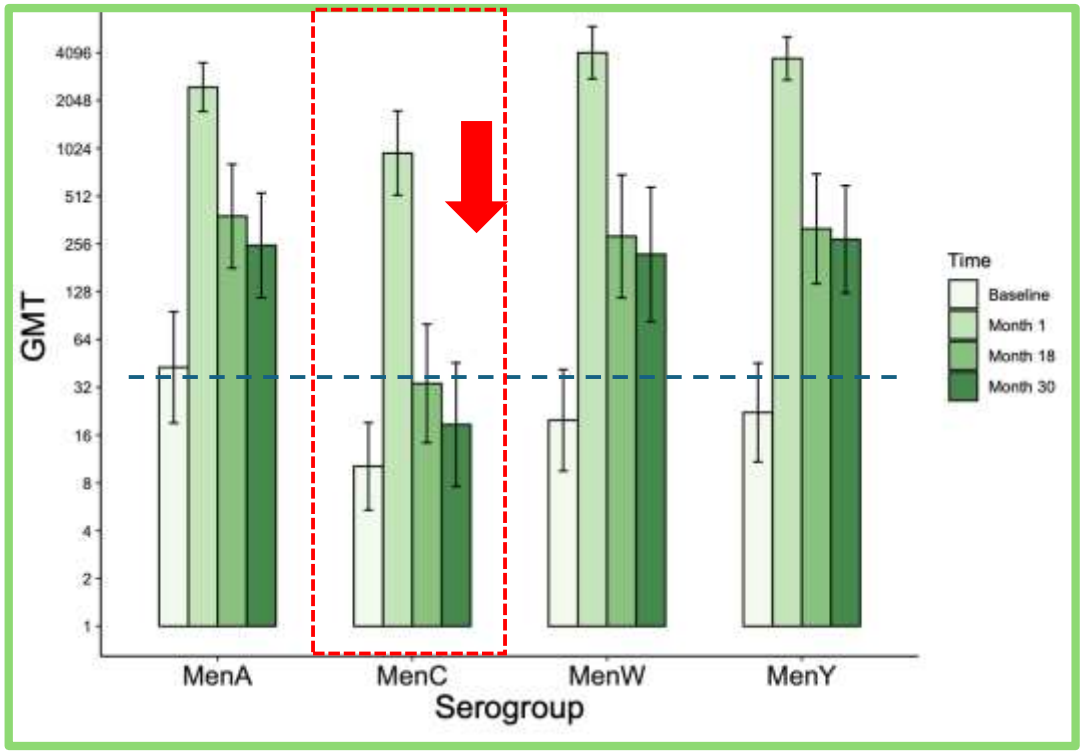
Use of the Pfizer Pentavalent Meningococcal Vaccine Among Persons Aged ≥10 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2023

Meningokok aşıları

İmmünojenite takip değerlendirmesi, serum bakterisidal antikor düzeyleri (GMT)

N=40, % 85 viral supresyon, CD4: medyan 260 (11-600)





Ramos A.S.F et HIV Med. 2024

Meningokok aşıları

MenB- 4C (NHBA- heparin füzyon proteini, NadA adhezin-proteini, Hbp-faktör H füzyon proteini, dış membran vezikülleri) **aşısı:** *N. gonorrhoeae'ye* karşı çapraz koruma

- MenB-4C aşılarının *N. gonorrhoeae'ye* karşı aşı etkililiği % 22- 46

  Aşılama ile GONORE insidansınsa % 30-59 azalma

- MenB-4C uygulananlarda MenACWY ile karşılaştırıldığında % 46 daha düşük gonore infeksiyonu

- **İngiltere:** MenB–4C ile gonore infeksiyonuna karşı % 33-47 koruma

Shamez N Ladhani et al. Lancet Infect Dis 2024; 24: e576–83

Gökengin D et al., The Lancet Regional Health - Europe 2023;34: 100738 Wnag B et al.Journal of Infection, 2024 Bruxvoort KJ et al.Clinical Infectious Diseases, 2023

HPV aşıları

9-26 yaş ve daha önce HPV aşısı uygulanmamış (Genel popülasyon)

27-45 yaş arasında HIV ile yaşayan bireyler (9-45 Yaş)

9 Valan HPV aşısı ile

3 doz aşılama **(0.1-2, 6 ay)**

Daha önce 2 veya 4 valan aşı ile aşılama öyküsü

- Yeniden aşılama rutin olarak önerilmez. (**Klinik değerlendirme** ile son aşıdan 1 yıl sonra yeniden aşılama)

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

https://www.eacsociety.org/media/guidelines-12.0.pdf

9-45 yaş

9 Valan aşı

HPV infeksiyon

Aşılama

Table 5. Comparison of five HIV guideline recommendations for HPV vaccine administration.

	BHIVA [22,25]	EACS [24]	NIH [23]	SIMIT [27]	WHO [26]
Who to vaccinate?	All aged ≤ 26 yo; MSM and women aged < 40; Defer if CD4 < 200/mm^3	All people aged between 9 and 45	All aged ≤ 26 For people between 27 and 45 years old, depending on risk factors	All aged ≤ 26 For people with more than 26 years evaluate risk/benefit	Girls aged between 9 and 14; females aged ≥ 15 years or males are recommended only if this is feasible, affordable, cost-effective, and does not divert resources from vaccination of the primary target population
Type of vaccine and doses	If available, prefer the 9-valent vaccine; otherwise, use the 4-valent vaccine For both, perform three doses: 0, 1–2, and 6 months	Prefer the 9-valent vaccine	If available, prefer the 9-valent vaccine; otherwise, use the 4-valent vaccine For both, perform three doses: 0, 1–2, and 6 months	If available, prefer the 9-valent vaccine; otherwise, use the 4-valent vaccine For both, perform three doses	Depending on which is available Performing three doses
Differences for people with low CD4/mm^3	Naïve people with CD4 < 200/mm^3: deferred until the ART starts	NP	NP	NP	NP
People with HPV disease	Perform vaccine despite age to reduce risk of recurrences	Perform vaccine despite age to reduce risk of recurrences	NP	NP	NP

Andrea De Vito et al.Vaccines 2023

HPV aşıları: Kanser önleyici aşılar

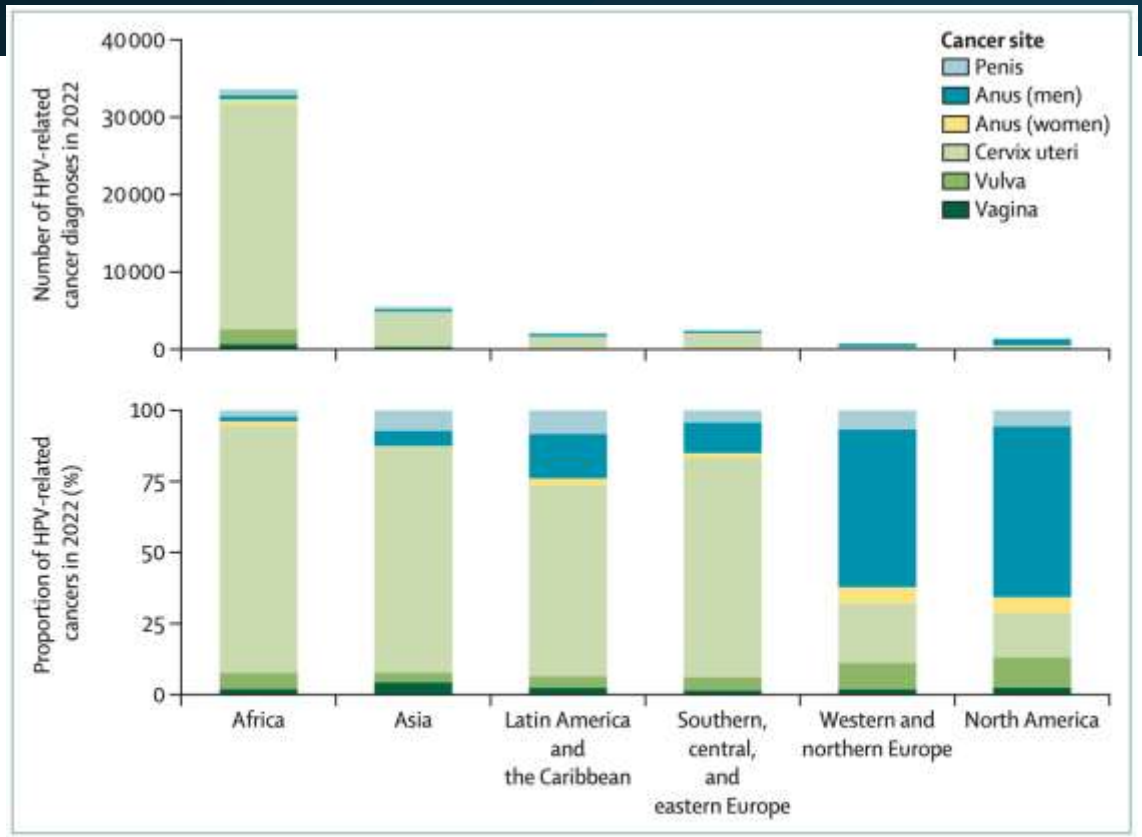


Figure 1: **Burden of HPV-related cancers diagnosed among people living with HIV in 2022 (International Agency for Research on Cancer estimates, personal communication)**
HPV=human papillomavirus.

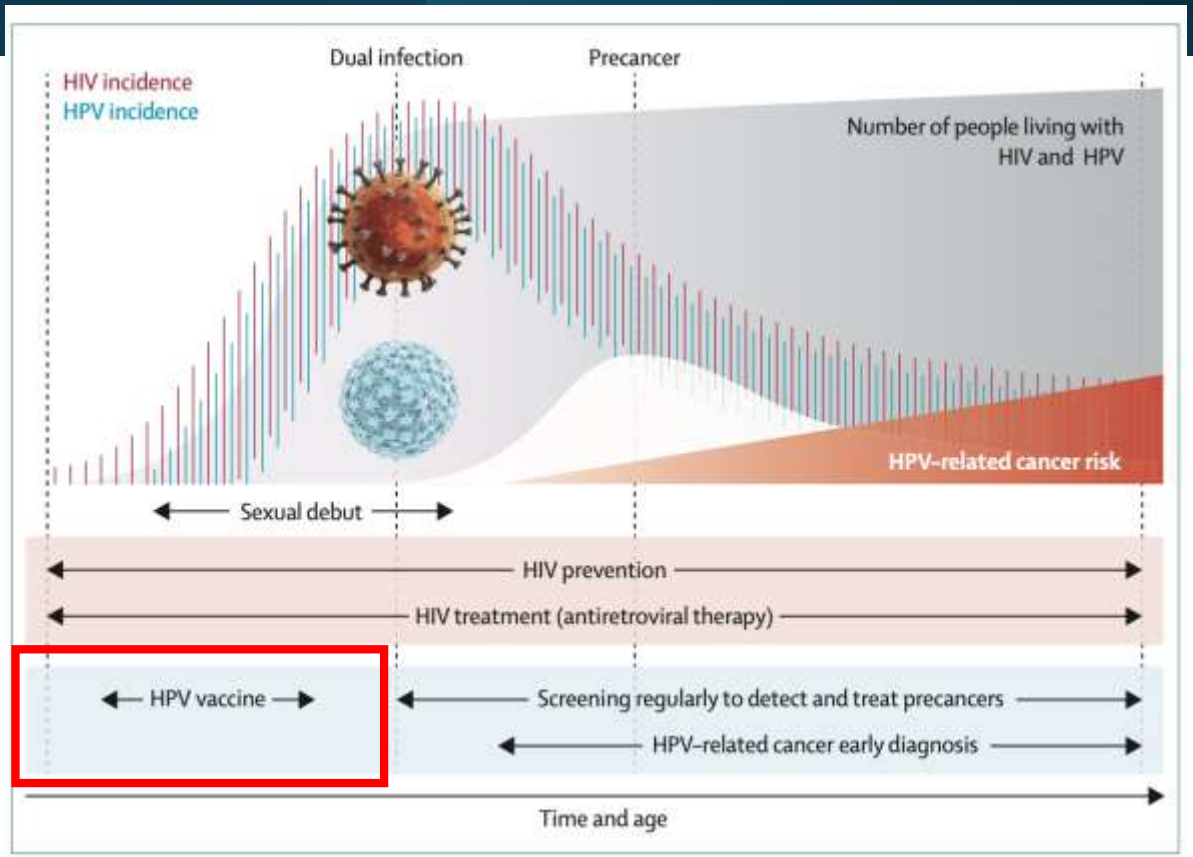


Figure 2: **HPV-related cancer prevention strategies for people living with HIV**

Anneli Uusküla et al.Lancet HIV 2025; 12: e293–302

HPV aşıları: Kanser önleyici aşılar

HPV yeast cell derived				
2-valent (Cervarix®)	Virus like particle HPV 16 L1 HPV 18 L1	aluminum hydroxide, 3-O-deacylated-4′-monophosphoryl lipid A	0-2-6	In women: 92.9% against CIN2, 80% against CIN3[107]
4-valent (Gardasil®)	Virus like particle HPV 6 L1 HPV 11 L1 HPV 16 L1 HPV 18 L1	aluminum hydroxyphosphate sulfate	0-2-6	In women: 100%, against HPV 16/18-related CIN 2/3 & AIS(96)
9-valent (Gardasil9®)	Virus like particle HPV 6 L1 HPV 8 L1 HPV 16 L1 HPV 18 L1 HPV 31 L1 HPV 33 L1 HPV 45 L1 HPV 52 L1 HPV 58 L1	aluminium hydroxyphosphate sulfate	ages 9–14: 0 & 6–12 months (2-dose) age >15.0 & 2 & 6 months (3-dose)	Similar efficacy with Gardasil 9 plus, induction of antibodies for 5 additional HPV strains In girls: 98.2% against HPV16/18-related CIN 2/3, AIS, Cervical Cancer 96% against HPV 6/11/16/18 related disease 88.7% against HPV 6/11/16/18 related persistent infection, genital warts, vulvar vaginal lesions In boys: 74.9% against HPV 6/11/16/18 related disease, 100% against penile/perineal/perianal intraepithelial neoplasia 89.3% against genital warts[102,108]

Gökengin D et al., The Lancet Regional Health - Europe 2023

Table 1. Summary of Human Papillomavirus (HPV) Vaccine Efficacy/Effectiveness (VE) Against Vaccine-Targeted Anal HPV Infection by Age Group and Analytic Population

Outcome	No. of Studies [References]	No. of Participants	No. With HPV Infection/Total No.		VE (95% CI), %	I^2 Value, %[a]
			Vaccine Group	Nonvaccine Group		
Incident/prevalent anal HPV infection						
Age ≤26 y						
PPE in clinical trials	2 [16, 17]	2390	18/1196	10/1194	84 (77–90)	0
ITT in clinical trials	2 [16, 17]	4885	132/2378	271/2507	55 (39–67)	46
Real-world studies	4 [18–21]	2735	181/1532	297/1203	77 (40–91)	81
Age >26 y						
ITT in clinical trials	1 [22]	100	29/53	30/47	14 (−19 to 38)	…
Persistent anal HPV infection[b]						
Age ≤26 y						
PPE in clinical trials	2 [17, 23]	1345	2/687	48/706	98 (87–100)	32
ITT in clinical trials	1 [17]	551	51/275	113/276	59 (43–71)	…
Age >26 y						
PPE in clinical trials	1 [24]	554	7/276	10/277	31 (−82 to 74)	…
ITT in clinical trials	1 [24]	574	28/288	41/286	35 (−5 to 60)	…

[a] I^2 was estimated and shown if ≥2 studies were included in each strata.

[b] Persistent infection was defined as detection of the same HPV type in anal specimens collected at ≥2 consecutive visits >4 months apart.

Aşı etkinliğinde aşılama yaşındaki geçikmeyle birlikte azalma

Gökengin D et al., The Lancet Regional Health - Europe 2023

Feixue Wei et al. The Journal of Infectious Diseases,2023

HPV aşıları

Clinical Infectious Diseases
MAJOR ARTICLE

A Phase IV, Open-label, Single-Arm, Multicentric Clinical Trial for Evaluation of Human Papillomavirus 9vHPV Vaccine Immunogenicity in Men Who Have Sex With Men Living With HIV: GeSIDA Study 10 017

Raquel Ron,[1,a,©] Claudio Díaz-García,[1,2,a,©] Elena Sendagorta,[3,©] Alfonso Cabello-Úbeda,[4,©] Elena Moreno,[1] Clara Crespillo-Andújar,[1,©] Rosa Feltes-Ochoa,[3,©] Irene Carrillo-Acosta,[4] Roser Navarro-Soler,[1,©] Herminia Esteban,[3,4] Miguel Górgolas,[5] Santiago Moreno,[1,2,©] Jose A. Perez-Molina,[1,b] and Sergio Serrano-Villar[1,b,©]

- 26 yaş ve üzeri (<35 yaş) **9 valan aşılama**
- 96 ayda serokonversiyon > % 85

- Aşı serogruplarına karşı toplam viral klirens (re-infeksiyonlar): % 74

Ron et al. Clinical Infectious Diseases, 2025

Tdap aşılaması

Primer aşılama yok

Tdap (1.doz), Td veya Tdap (1.ay 2.doz)

Td veya Tdap (6-12 ay 3.doz)

10 yılda bir Tdap veya Td booster

Primer aşılama var

1 doz Tdap, 10 yılda bir Tdap

veya Td

Gebelik

27-36. haftalarda Tdap

(18-36 hafta)

(Her gebelikte)

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

Influenza aşılaması

Her yıl – Eylül/Ekim
(IIV3 veya RIV3**)**

B/Phuket/3073/2013 (B/Yamagata lineage)-like virus aşı içeriğinden çıkarıldı. (Mart 2020'den itibaren tespit edilmiyor)

Farklı risk gruplarında farklı influenza aşıları

- **Yüksek doz aşılar** (HD-IIV3): ≥ 65 yaş, solid organ nakil alıcıları
- **Adjuvanlı ((MF59) aşılar** (a-IIV3) : ≥ 65 yaş, solid organ nakil alıcıları

Aşı tipi- Aşı zamanlaması-Ek doz

Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices United States, 2024–25 Influenza Season

Duration of the serological response and effectiveness of the inactivated influenza vaccine in healthy adults aged 18–65 years: a systematic review and meta-analysis

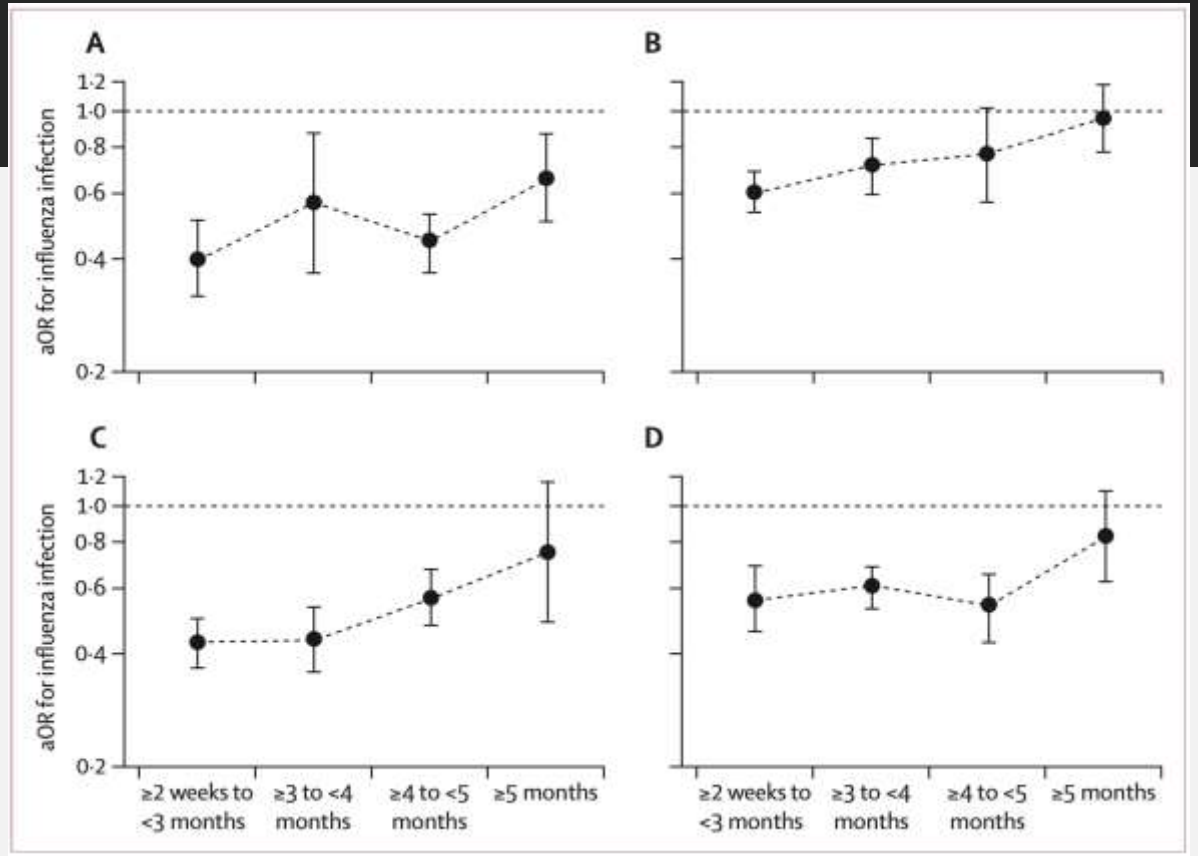
Joshua Nazareth, Neyme Veli, Daniel Pan, Christopher A Martin, Aisha Kekere-Ekun, Faduma-Idil A Hassan, Pip Divall, Amani Al-Orabi, Lucy Teece, Iain Stephenson, Martin J Wiselka, Julian W Tang, Laura Nellums, Manish Pareek

Summary

Background The protection provided by the inactivated influenza vaccine (IIV) in adults can wane during a single influenza season. We aimed to assess temporal changes in haemagglutinin inhibition assay (HAI) titres and vaccine effectiveness in healthy adults after IIV.

Lancet Microbe 2025; 6: 101136

Published Online October 7, 2025



Adjuvanlı ((MF59) aşılar (a-IIV3)

Yüksek doz aşılar

Aşı tipi- Aşı zamanlaması-Ek doz

RSV aşılaması

≥ 75 yaş

60-74 yaş + komorbid hastalık

(FDA-EMA: ≥ 60 yaş, 50-59 + komorbid hastalık)

Gebelik

(32-36 hafta- Eylül - Ocak)

Orta-Ağır immünsupresyon: CD4 <200 hücre/mm^3, AIDS tanımlayıcı hastalık,semptomatik HIV hastaları, tedavisiz hasta

+ 19-59 Yaş + Komorbid hastalıklar
≥ 18 yaş

Adjuvanted protein subunit vaccine (Arexvy, GSK)

Bivalent protein subunit vaccine (Abrysvo, Pfizer) (+ Gebe)

mRNA vaccine (mRESVIA, Moderna)

Tek doz öneri (Uzun dönem AE verileri takip ediliyor)

Ağustos-Ekim arasında

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

Zona zoster (Rekombinant) aşılaması

≥ 50 yaş

İmmünobaskılanmış hastalar

(CD4 sayısından bağımsız olarak HIV ile yaşan bireyler)

- **2 doz aşılama** (0, 2-6 ay, minimum interval 4 hafta)
- Zona yada su çiçeği öyküsü olanlar veya su çiçeği aşısı olanlarda aşılama
- İmmünkompetan kişilerde aşı öncesi serolojik testleme önerilmiyor.

- **HIV ile yaşayan bireylerde bağışıklık yanıtı değerlendirilmeli**

(Geçirilmiş su çiçeği veya zona, iki doz su çiçeği aşısı kanıtı ve serolojik kanıt)

Use of Recombinant Zoster Vaccine in Immunocompromised Adults Aged ≥19 Years: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

Zona zoster (Rekombinant) aşılaması

Vaccine 64 (2025) 127723

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Herpes zoster reactivation in a cohort of people living with HIV vaccinated with recombinant vaccine

Stefania Arsuffi [a], Luca Rossi [a], Fabio Riccardo Colombo [b], Miriam Inverardi [a], Elisa Mirovic [c], Davide Laurenda [a], Ilaria Izzo [a], Stefano Rapino [a], Deborah Castelli [a], Francesca Gaffurini [a], Itala Polesini [a], Francesco Castelli [a], Stefano Calza [b], Eugenia Quiros-Roldan [a], Emanuele Focà [a,*]

Aşı öncesi HZ prevalansı

% 37.24 (% 29.36 – 45.65)

Aşı sonrası HZ prevalansı

% 8.97 %4.86 % - 14.84)

Aşı öncesi PHN %19.23 [% 11.18 - 29.73)

Aşı sonrası PNH -

S. Arsuffi et al. Vaccine 64 (2025) 127723

Canlı aşılar

Ağır immünsupresyon: CD4 <%15 veya <200 hücre/mm^3

- **Ağır immünsupresif kişilerde** canlı aşılar kontrendikedir.

  Kızamık-Kızamıkçık-Kabakulak (KKK), Suçiçeği

  BCG, Sarı humma, Tifo, kolera, Deng aşısı, Ebola vektör aşısı

  Canlı influenza aşısı (LAIV3), Rotavirus (RV1,RV5), ACAM2000

- Canlı aşılar eş zamanlı veya mininum 28 günlük aralıkla uygulanmalıdır.

  (Rotavirus ve tifo istisna)

- Canlı aşılar diğer inaktive aşılar ile birlikte uygulanabilir.

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

Kızamık-Kızamıkçık-Kabakulak aşılaması

KKK için bağışılık yanıtı olmayan

(Dokümante KKK aşı öyküsü ve serolojik kanıt) ve **CD4 ≥ 200 hücre/mm³ veya infeksiyon kontrolü**

(ART tedavi altında, virolojik yanıt)

Gebelerde aşılama **gebelik sonrasına ertelenmeli,** ART tedavi altında ve CD4 ≥ 200 hücre/mm³

2 doz, bir ay arayla

2 doz sonrası serolojik yanıt alınmazsa (özellikle virolojik baskılanma öncesinde aşılama) **2 doz serinin tekrarı önerilebilir.**

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

Su çiçeği aşılaması

Varicella için bağışılık yanıtı olmayan

(Dokümante aşı öyküsü ve serolojik kanıt) ve **CD4 ≥**

200 hücre/mm³

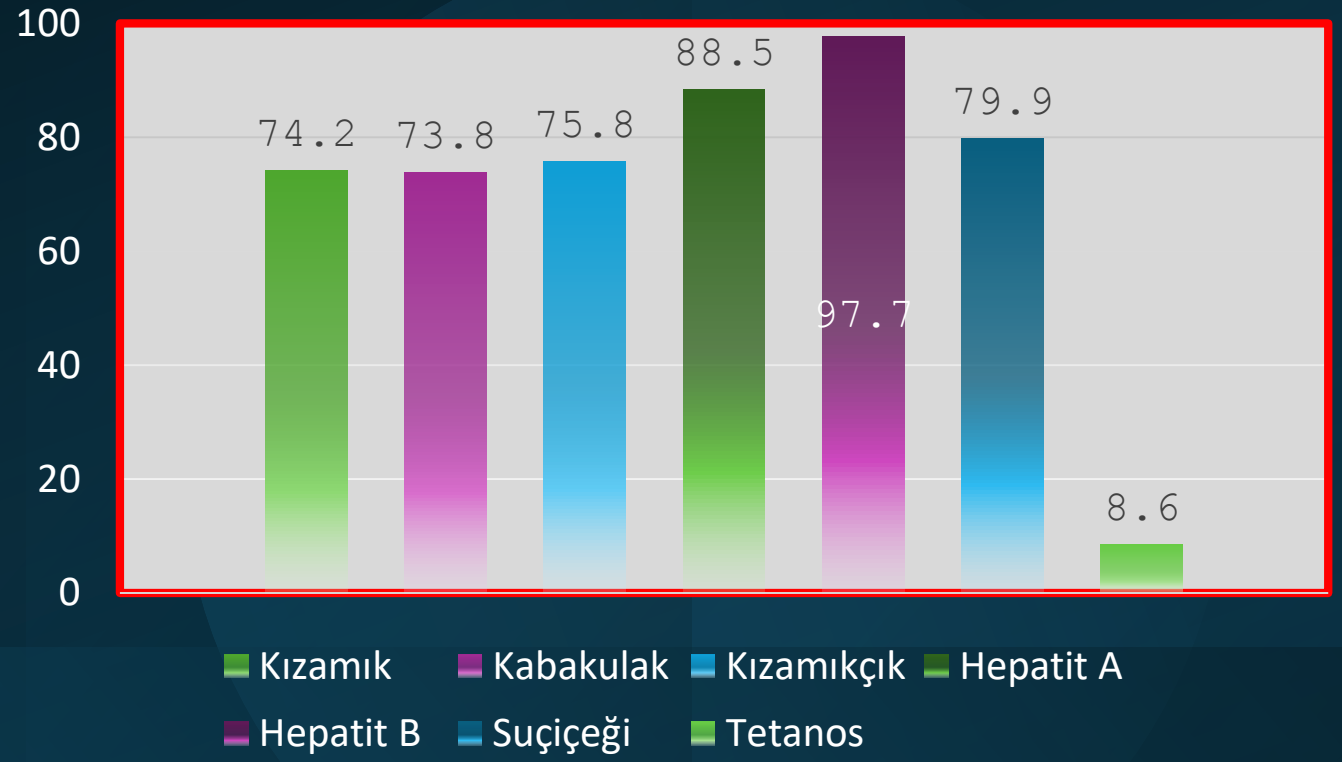
2 doz, 4-8 hafta arayla

Gebelerde aşılama önerilmez.

https://www.cdc.gov/vaccines/hcp/imz-schedules/downloads/adult/adult-combined-schedule.pdf

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/whats-new

HIV İLE YAŞAYAN BİREYLER, TÜRKİYE,N=523



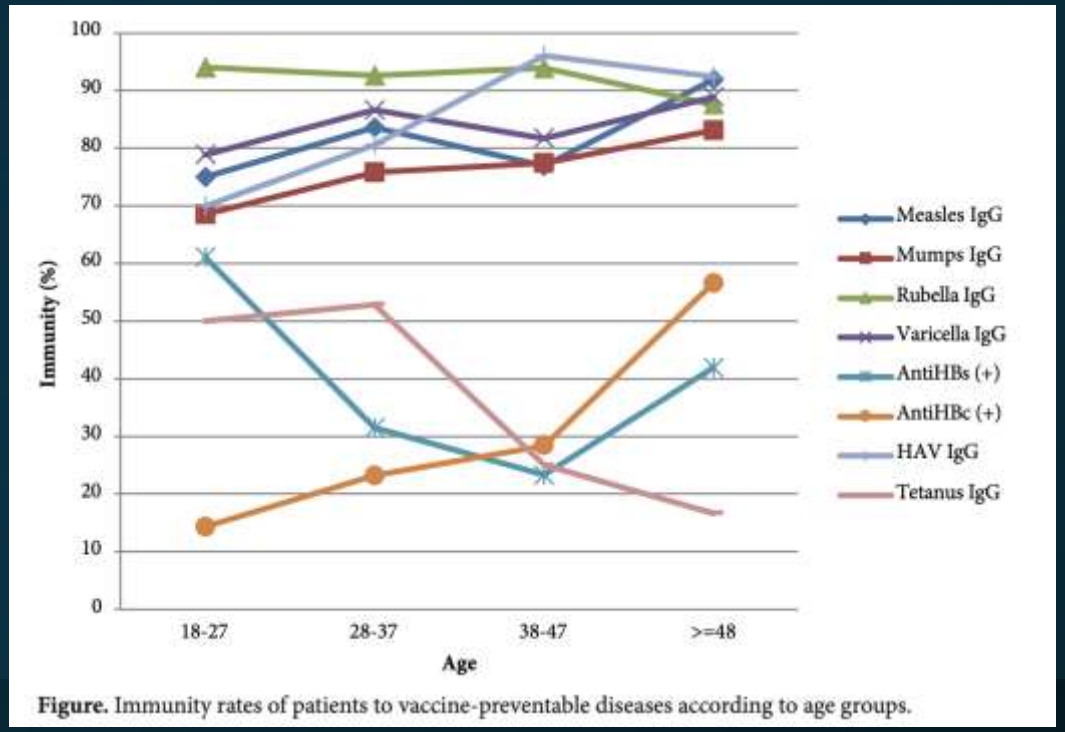
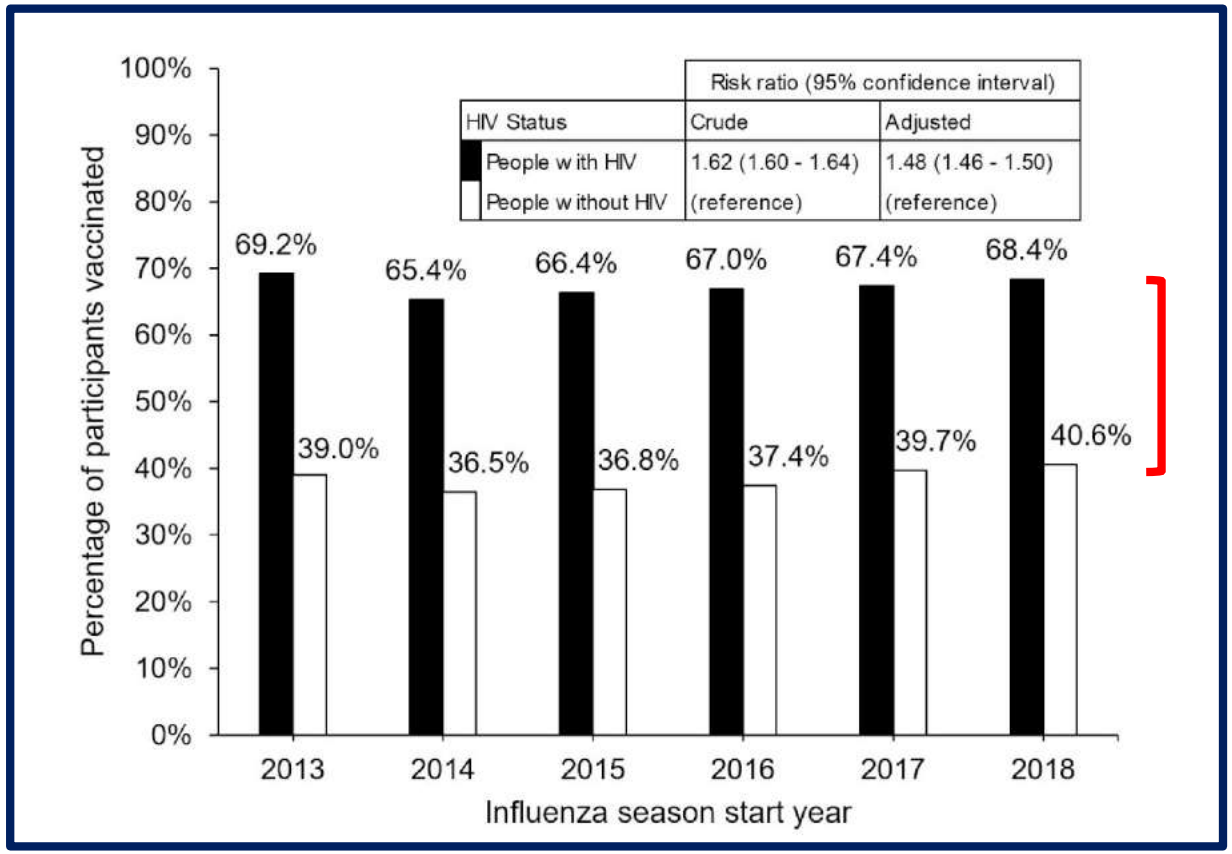


Figure. Immunity rates of patients to vaccine-preventable diseases according to age groups.

CANDEVİR et al. , Turk J Med Sci,2021

Aşı kapsayıcılık

ABD, Yaş, cinsiyet, etnisite açısından eşleştirilmiş, n=9272 HIV (+) ve n= 194 392 HIV (-), **İnfluenza**



- Aşı (Hekimin aşı önerisine) duyarlılık daha yüksek
- **Sağlık güvencesine sahip olmamak (Aşı erişimi) , eşlik eden hastalık yükü, depresyon, Düşük CD4 sayısı, Yüksek viral yük**

Türkiye dinamikler ?

Brandon M. Imp et al. CID, 2023:77

Sağlık Bakanlığından temin edebildiğimiz aşılar

-KPA13 (Prevenar 13) (Temin sıkıntısı yaşamadık)
-Hepatit B (Flovac-B) (Aralıklı temin sıkıntısı)
-Hepatit A (Healive) (Aralıklı temin sıkıntısı)
-Meningokok (Nimenrix) (Temin sıkıntısı yaşamadık)
-Tdap/Td (Temin sıkıntısı yaşamadık)
-KKK (Priorix)(Aralıklı temin sıkıntısı) (BazenTemin edilen aşıyı uygulamıyoruz)
-Su çiçeği (Aralıklı temin sıkıntısı)

Eczaneden ÜCRETLİ olarak temin edebildiğimiz (RUHSATLI) aşılar

PPA23 (Pneumovax23) (Aralıklı temin sıkıntısı)
KPA15 (VAXNEUVANCE) (Deneyimimiz yok)
HPV (Gardacil 9) (Temin sıkıntısı yaşamadık)
KPA20 (Prevenar 20) (Temin sıkıntısı yaşamadık)
Tdap (ADACEL) (Aralıklı temin sıkıntısı)
Zona aşısı (Shingrix) (Temin sıkıntısı yaşamadık)
MenB (Bexsero-Trumenba) (Temin sıkıntısı yaşamadık)
RSV (Arexvy, Abrsyvo)

Eczaneden GERİ ÖDEME KAPSAMINDA temin edebildiğimiz

-Influenza (Temin sıkıntısı yaşamadık)

Temin edilemeyen aşılar

-Covid-19 (Güncel aşılar)
-Adjuvanlı hepatit B aşılar
-Adjuvanlı-Yüksek doz influenza aşıları
-Pentavalan meningokok aşıları (MenACWY-TT/MenB-FHbp)
Mpox (JYNNEOS)