DİYABET KILAVUZLARINDA BAĞIŞIKLAMA ÖNERİLERİ VE TÜRKİYE'DE DURUM

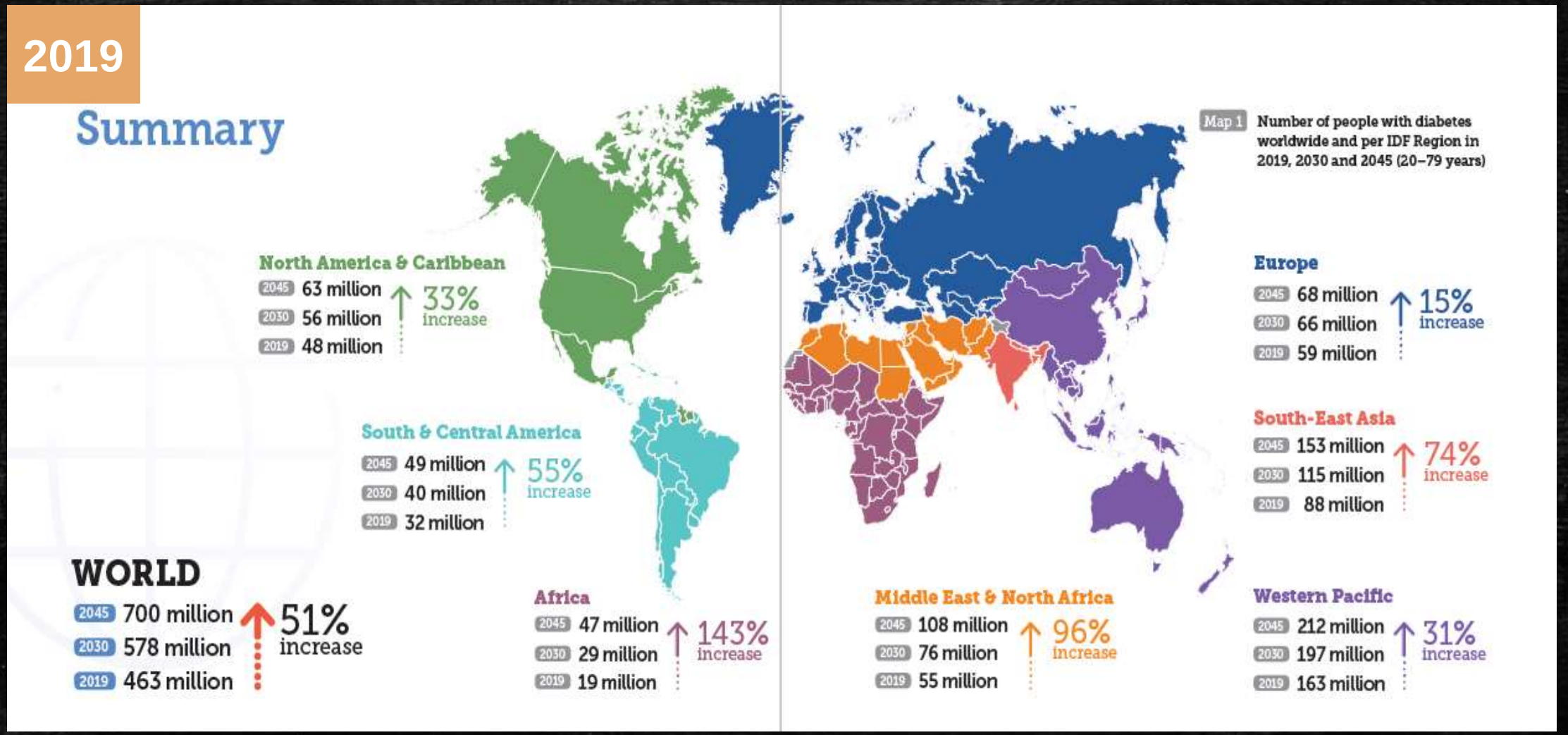
DR. MEHMET MUHİTTİN YALÇIN

Kasım 2024

Sunum Planı

- Dünyada ve Türkiye'de diyabet
- Diyabette enfeksiyonlar
- Ulusal ve uluslararası kılavuzlarda diyabette aşılama
- Gerçek Yaşam

Diyabet bulaşıcı olmayan bir Salgın..



Diabetes Atlas. 9th ed. International Diabetes Federation. 2019

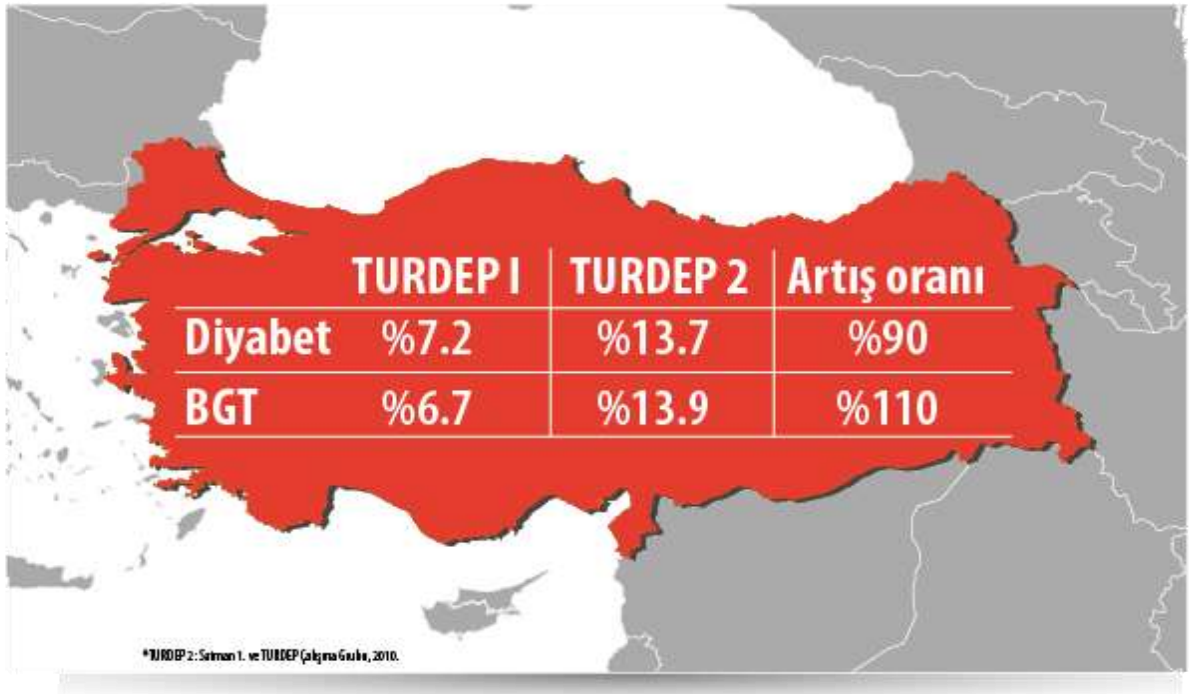
Table 3.5 Top 10 countries or territories for number of adults (20–79 years) with diabetes in 2019, 2030 and 2045

2019			2030			2045		
Rank	Country or territory	Number of people with diabetes (millions)	Rank	Country or territory	Number of people with diabetes (millions)	Rank	Country or territory	Number of people with diabetes (millions)
1	China	116.4 (108.6–145.7)	1	China	140.5 (130.3–172.3)	1	China	147.2 (134.7–176.2)
2	India	77.0 (62.4–96.4)	2	India	101.0 (81.6–125.6)	2	India	134.2 (108.5–165.7)
3	United States of America	31.0 (26.7–35.8)	3	United States of America	34.4 (29.7–39.6)	3	Pakistan	37.1 (15.8–58.5)
4	Pakistan	19.4 (7.9–30.4)	4	Pakistan	26.2 (10.9–41.4)	4	United States of America	36.0 (31.0–41.6)
5	Brazil	16.8 (15.0–18.7)	5	Brazil	21.5 (19.3–24.0)	5	Brazil	26.0 (23.2–28.7)
6	Mexico	12.8 (7.2–15.4)	6	Mexico	17.2 (9.7–20.6)	6	Mexico	22.3 (12.7–26.8)
7	Indonesia	10.7 (9.2–11.5)	7	Indonesia	13.7 (11.9–14.9)	7	Egypt	16.9 (9.0–19.4)
8	Germany	9.5 (7.8–10.6)	8	Egypt	11.9 (6.4–13.5)	8	Indonesia	16.6 (14.6–18.2)
9	Egypt	8.9 (4.8–10.1)	9	Bangladesh	11.4 (9.4–14.4)	9	Bangladesh	15.0 (12.4–18.9)
10	Bangladesh	8.4 (7.0–10.7)	10	Germany	10.1 (8.4–11.3)	10	Turkey	10.4 (7.4–13.3)

i 95% confidence intervals are reported in brackets.

Ülkemizde Diyabet

Türkiye Diyabet Epidemiyoloji (TURDEP 2) Çalışması Genel Sonuçları (20 yaş üstüpopülasyonda)



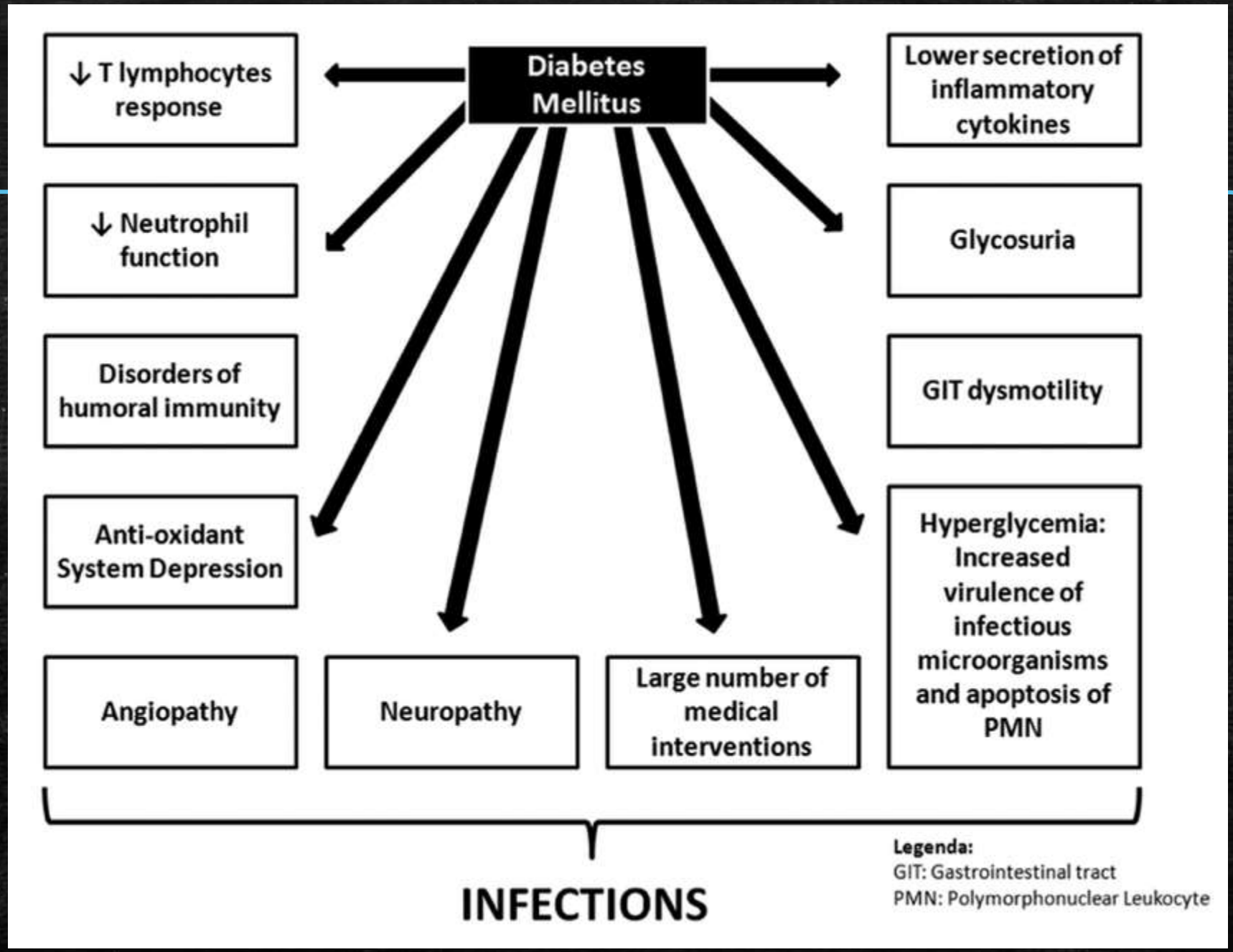
	TURDEP I	TURDEP 2	Artış oranı
Diyabet	%7.2	%13.7	%90
BGT	%6.7	%13.9	%110

*TURDEP 2: Satman I. ve TURDEP Çalışma Grubu, 2010.

TURDEP ÇALIŞMASI

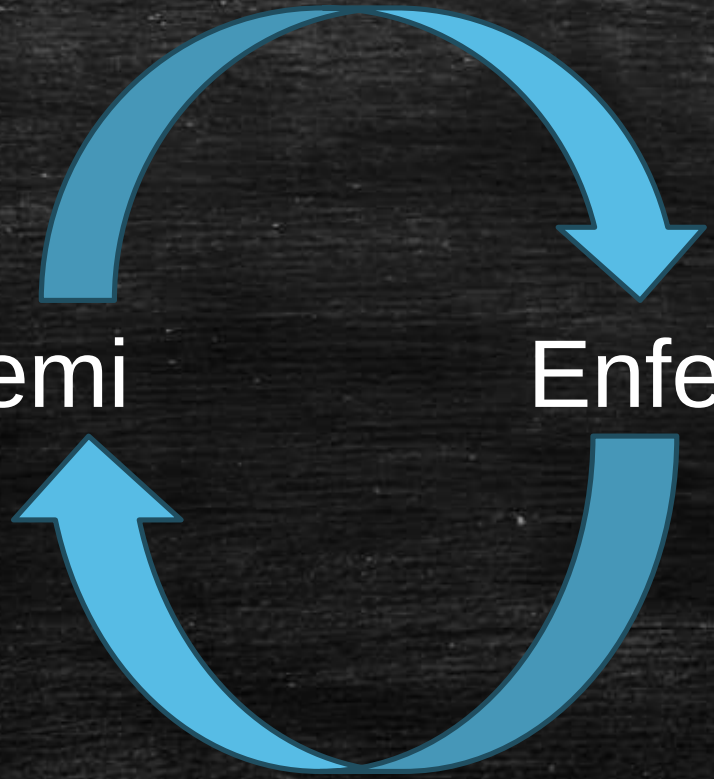
- Turdep 1 → 2001
- Turdep 2 → 2011
- Artış oranı %90
- 2017 yılı prevelans tahmini %16.5

Diyabette Enfeksiyonlar



Casquerio ve ark, 2016

Hiperglisemi



Enfeksiyonlar

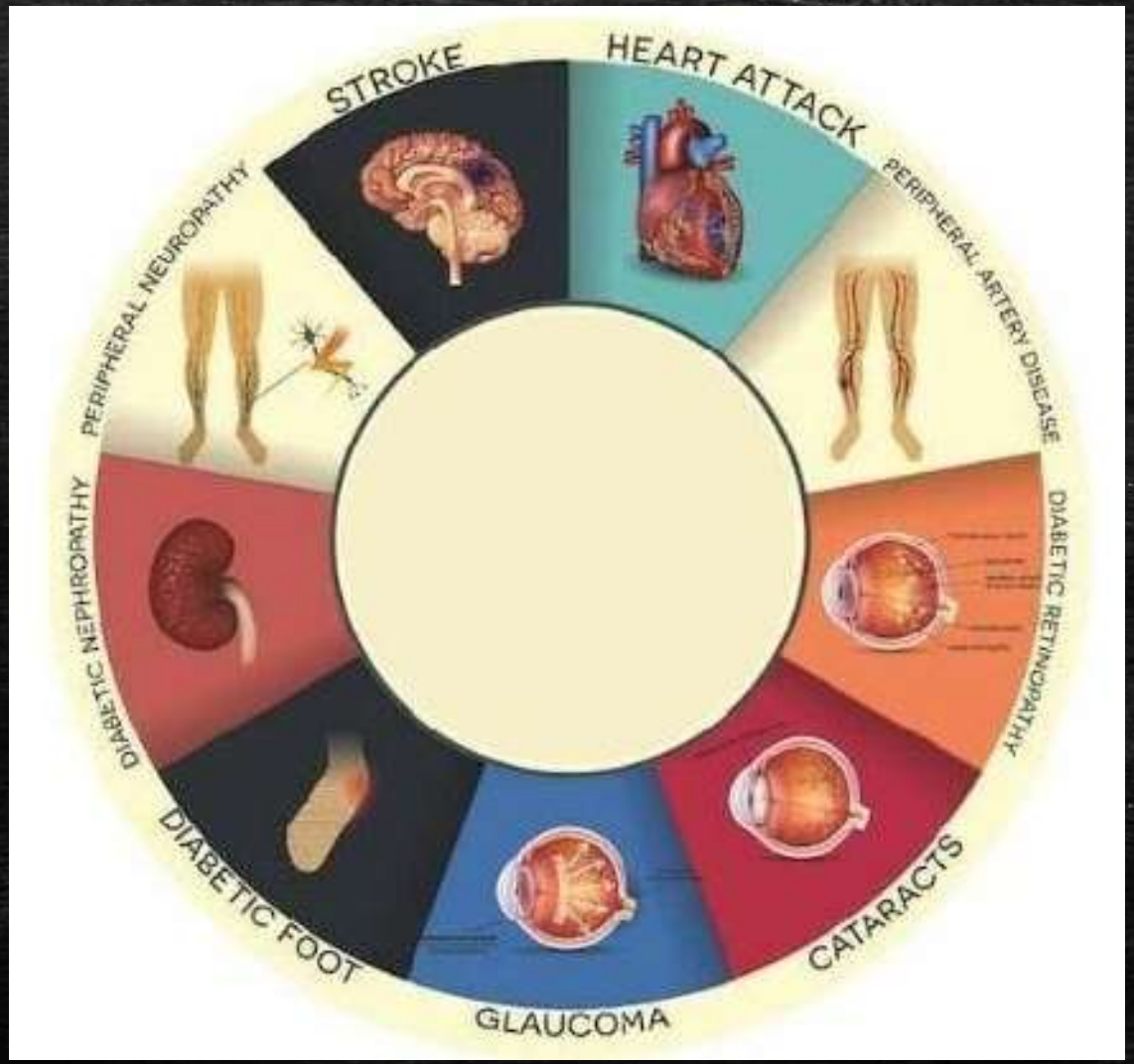
Enfeksiyonu Olanda;

- Hiperglisemi
- İnsülin Direnci

Diyabetik bireylerde;

- Hücresel İmmünite
- Humoral İmmünite

Diyabet Bir Komplikasyonlar Hastalığıdır



Solunum sistemi enfeksiyonları	Pnömoni
	İnfluenza
	COVID-19 (SARS-CoV-2)
	Tüberküloz

Gastrointestinal sistem enfeksiyonları	Helicobakter pilori gastriti
	Oral ve özefagial kandidiyazis
	Amfizematöz kolesistit
	Hepatit B ve C
	Enterovirüs

Üriner sistem enfeksiyonları	Asemptomatik bakteriüri
	Fungal sistit
	Amfizematöz sistit
	Bakteriyel piyelonefrit
	Perinefrik abse

Deri ve yumuşak doku enfeksiyonları	Ayak enfeksiyonları
	Nekrotizan fasiit
	Fournier gangreni

Baş boyun enfeksiyonları	İnvaziv eksternal otit
	Rinoserebral mukormikoz

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Diyabet-----İnfluenza

Diyabetli Bireylerde;

- İnfluenza infeksiyonlarına bağlı ölüm X2-4
- Hastane Yatış Oranı
- YB yatış oranı ve süresi

Diyabet-----Pnömoni

Table 1 Overview of risk factors associated with community-acquired pneumonia and pneumococcal disease

	Cohort studies		Case-control studies	
Risk factor	**Number of cohorts***	**Risk range†**	**Number of cohorts***	**Risk range†**
Community-acquired pneumonia				
Chronic respiratory diseases	8‡	OR: 1.5 HR: 2.9 Rate ratio: 3.8–8.6	15§	OR: 1.3–13.5 RR: 1.6–2.8 HR: 1.2
Current smoking status	4	HR: 1.1 Rate ratio: 3.3–4.0	6	OR: 1.0–2.3 HR: 2.0 RR: 1.5
Diabetes mellitus	7	HR: 1.0–1.9 Rate ratio: 1.6–3.1	9	OR: 1.0–1.4 HR: 1.1 RR: 1.2–1.3
Chronic heart disease	6	HR: 1.5–3.1 Rate ratio: 3.8–4.9	17	OR: 1.0–3.3 HR: 1.3 RR: 1.3–2.6

Torres ve ark, Thorax, 2015

Diyabet-----Pnömoni

Table 2—*RRs for hospitalizations associated with pneumonia*

Exposure	Case subjects	Population control subjects	Unadjusted RR (95%CI)	Adjusted RR (95% CI)*
Diabetes				
Absent	29,750 (86.9)	313,904 (91.7)	1.0 (reference)	1.0 (reference)
Present	4,489 (13.1)	28,486 (8.3)	1.68 (1.62–1.74)	1.26 (1.21–1.31)
Diabetes type				
Diabetes absent	29,750 (86.9)	313,904 (91.7)	1.0 (reference)	1.0 (reference)
Type 1 diabetes	101 (0.3)	187 (0.1)	5.55 (4.34–7.08)	4.43 (3.40–5.77)
Type 2 diabetes	4,388 (12.8)	28,299 (8.3)	1.65 (1.59–1.71)	1.23 (1.19–1.28)
Duration of diabetes				
Diabetes absent	29,750 (86.9)	313,904 (91.7)	1.0 (reference)	1.0 (reference)
<5 years	1,941 (5.7)	12,903 (3.8)	1.60 (1.53–1.68)	1.21 (1.14–1.27)
≥5 to <10 years	1,324 (3.9)	8,817 (2.6)	1.60 (1.51–1.70)	1.24 (1.16–1.32)
≥10 years	1,224 (3.6)	6,766 (2.0)	1.93 (1.81–2.06)	1.37 (1.28–1.47)
A1C				
Diabetes absent	29,750 (86.9)	313,904 (91.7)	1.0 (reference)	1.0 (reference)
Diabetes present A1C <7%	1,149 (3.4)	7,500 (2.2)	1.64 (1.54–1.74)	1.22 (1.14–1.30)
Diabetes present A1C ≥7 to <8%	607 (1.8)	3,999 (1.2)	1.62 (1.48–1.76)	1.23 (1.12–1.36)
Diabetes present A1C ≥8-<9%	407 (1.2)	2,442 (0.7)	1.77 (1.59–1.97)	1.29 (1.15–1.44)
Diabetes present A1C ≥9%	568 (1.7)	2,664 (0.8)	2.26 (2.07–2.48)	1.60 (1.44–1.76)
Diabetes present A1C unknown	1,758 (5.1)	11,881 (3.5)	1.58 (1.50–1.66)	1.21 (1.14–1.28)

Kornum ve ark, Diabetes Care, 2008

Hiperglisemi

Pnömoni

Pnömonisi Olanda;

- Hiperglisemi
- Hipoglisemi
- YB Yatış Süresi
- Mortalite

Diyabetlileride;

- Pnömoni Riski
- Hastaneye Yatış Riski
- Hastaneye Yatanlarda Mortalite

Diyabet-----Hepatit B

Diyabetli Bireylerde;

- HBV riski
  - (enfekte kan ile temas veya uygunsuz malzeme (glukoz ölçüm cihazı ve enfekte iğneler) kullanımı)

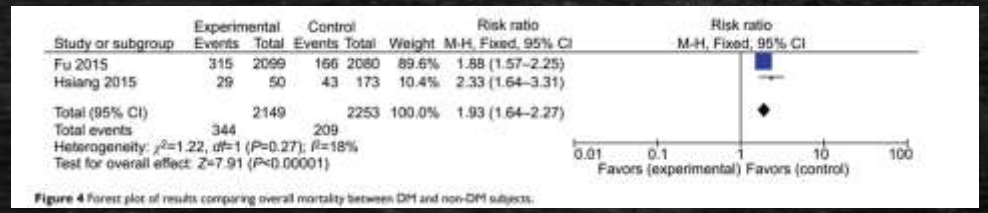
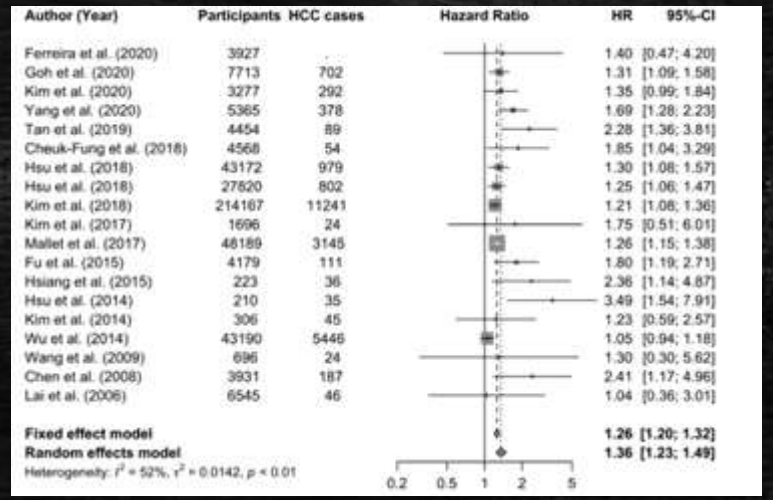


Figure 4 Forest plot of results comparing overall mortality between DM and non-DM subjects.

- Akut HBV riski X2



- Akut HBV olanda ölüm oranı

- Hepatit B => HCC riski

Campbell ve ark, J Viral Hepatitis, 2020

Diyabet-----COVID

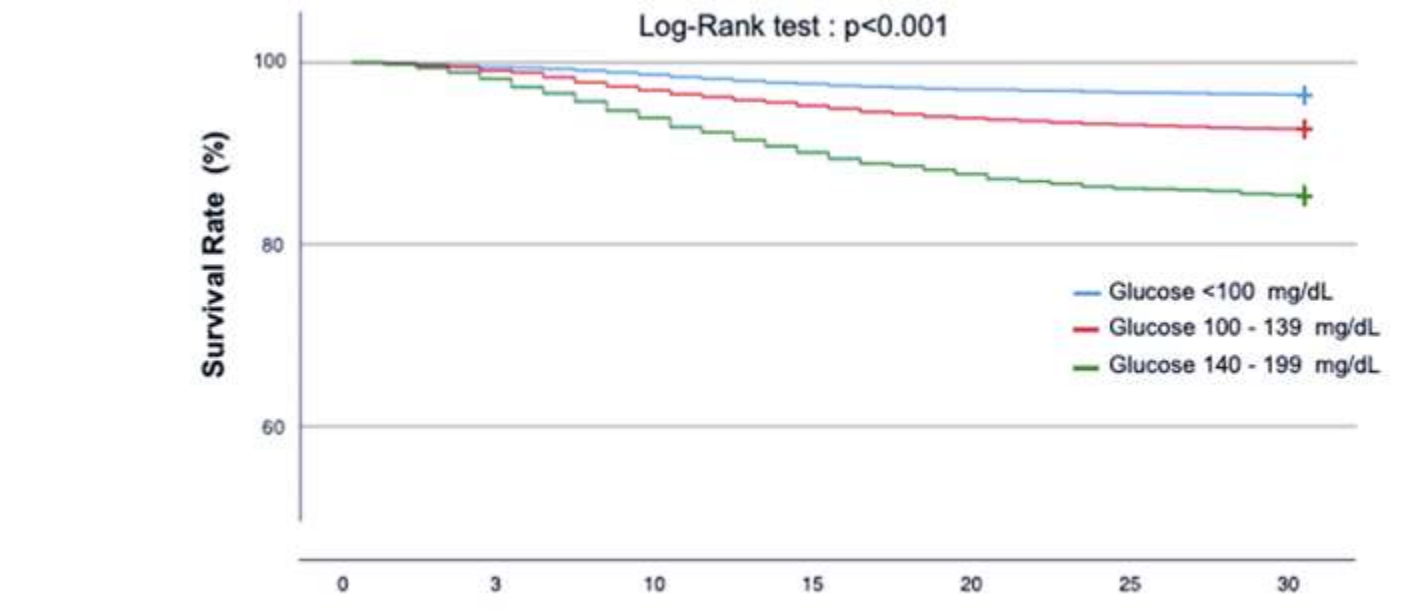
- Hastane yatışı uzun
- Pnömoni sıklığı 
- Yoğun bakım yatışı 
- Mortalite 

Diyabet-----COVID

- Kötü Kontrollü Diyabette komplikasyonlar / Mortalite 
- Yoğun Bakım Hastalarında
  - Hiperglisemi
  - Hipoglisemi

  } Mortalite artar
- COVİD hastalarında öglisemininin sağlanması
  - İnflamatuvar yanıtı azaltıyor (IL-6)
  - Koagülasyon belirteçlerini azaltıyor (D-Dimer)
  - Mortaliteyi azaltıyor

TurCoGlycemia Çalışması



Haymana ve ark, Endocrine, 2021

TEMD ÖNERİLERİ

- Diyabette bakteriyel, viral ve fungal enfeksiyon sıklıkları artmıştır.
- COVID-19 sırasında ya da sonrasında yeni başlayan diyabet vakaları, yakın takip edilmelidir (B).
- COVID-19 saptanan diyabetlilerde glisemik hedefler sağlanmalıdır (B).
- Asemptomatik ya da hafif semptomlu SARS-CoV-2 ile enfekte diyabetli kişilerde antidiyabetik tedavilerin değiştirilmesi gerekli değildir (B).
- Diyabetikler COVID-19´un uzun vadede gelişebilecek olası komplikasyonları yönünden takip edilmelidir (E).
- Diyabetli kişilere SARS-CoV-2 aşıları önerilmelidir (B).

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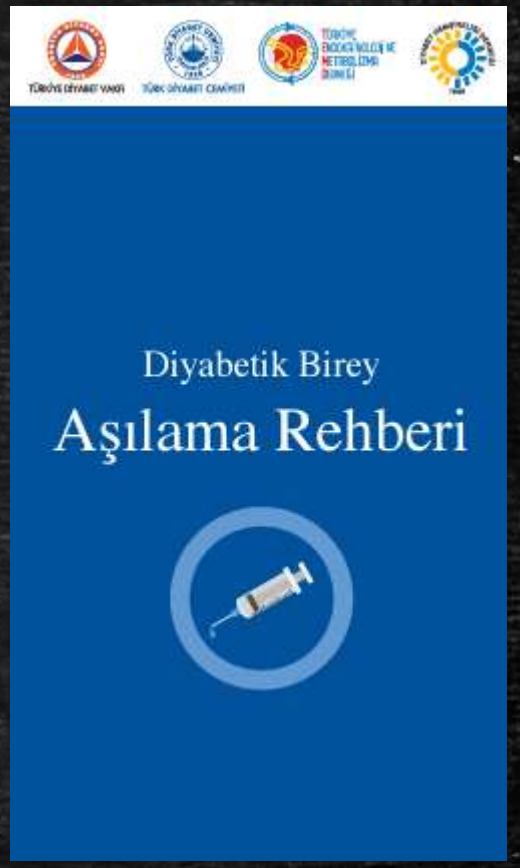

Diyabette Bağışıklama Önerileri

İnfluenza

- İnaktif/ Rekombinan İnfluenza Aşısı
  - >6 aylıktan itibaren

- >65 yaş => yüksek doz kuadrivalan aşıdan fayda görebilir

Diyabetlilere İnfluenza Aşısı

Outcome	Study period*	Vaccinated			Unvaccinated			Unadjusted model‡		Adjusted model§	
		No. of events	PY	Rate†	No. of events	PY	Rate†	IRR (95% CI)		IRR (95% CI)	
Hospital admissions for acute myocardial infarction	Preinfluenza	452	49 181.9	9.19	1174	135 674.6	8.65	1.06	(0.95–1.18)	0.91	(0.81-1.03)
	Influenza	580	64 633.9	8.97	329	43 597.7	7.55	1.18	(1.03–1.36)¶	0.78	(0.65–0.93)**
	Postinfluenza	712	80 677.7	8.83	316	43 305.6	7.30	1.20	(1.05–1.38)**	0.87	(0.71–1.05)
	Summer	1133	139 014.5	8.15	446	72 567.9	6.15	1.32	(1.18–1.47)††	0.96	(0.82–1.12)
Hospital admissions for stroke	Preinfluenza	323	49 210.8	6.56	1102	135 678.7	8.12	0.81	(0.71–0.91)††	0.74	(0.65–0.85)††
	Influenza	486	64 688.4	7.51	310	43 594.4	7.11	1.05	(0.91–1.21)	0.82	(0.67–1.00)
	Postinfluenza	559	80 768.3	6.92	331	43 291.6	7.65	0.90	(0.78–1.03)	0.73	(0.59–0.89)**
	Summer	1046	139 220.9	7.51	358	72 555.7	4.93	1.53	(1.35–1.73)††	1.17	(1.00–1.41)
Hospital admission for heart failure	Preinfluenza	1180	49 005.6	24.08	3199	135 431.5	23.62	0.99	(0.92–1.06)	0.88	(0.82–0.95)††
	Influenza	1617	64 288.5	25.15	813	43 412.2	18.73	1.28	(1.17–1.40)††	0.83	(0.74–0.93)††
	Postinfluenza	1790	80 067.4	22.36	676	43 008.7	15.72	1.40	(1.27–1.53)††	0.84	(0.73–0.95)**
	Summer	2770	137 484.2	20.15	870	71 943.3	12.09	1.65	(1.52–1.79)††	1.06	(0.95–1.18)
Hospital admission for pneumonia/ influenza	Preinfluenza	1245	49 076.0	25.37	3007	135 478.0	22.20	1.15	(1.07–1.23)††	1.08	(1.01–1.17)**
	Influenza	1908	64 331.7	29.66	1307	43 326.2	30.17	0.96	(0.89–1.03)	0.75	(0.68–0.82)††
	Postinfluenza	1989	80 081.9	24.84	919	42 845.0	21.45	1.15	(1.06–1.25)††	0.86	(0.77–0.97)**
	Summer	2623	137 505.4	19.08	1156	71 571.1	16.15	1.18	(1.10–1.27)††	0.88	(0.80–0.98)¶
All-cause mortality	Preinfluenza	1381	49 243.8	28.04	4441	135 812.9	32.70	0.86	(0.81–0.91)††	0.77	(0.72–0.83)††
	Influenza	2294	64 569.0	35.53	1797	43 029.2	41.76	0.85	(0.80–0.90)††	0.50	(0.45–0.54)††
	Postinfluenza	2838	80 362.3	35.32	1464	42 403.0	34.53	1.02	(0.96–1.09)	0.58	(0.52–0.65)††
	Summer	4732	137 644.4	34.38	2123	70 526.3	30.10	1.14	(1.08–1.20)††	0.66	(0.61–0.72)††

Vamos ve ark, CMAJ, 2016

Pnömokok

- Daha önce aşılanmamışsa
  - Tek doz PCV 15 => PPSV 23 ya da
  - Tek doz PCV 20
- PPSV23 => PCV 15 ya da 20
- PCV 13 => PPSV23

Diyabetiklere Pnömokok Aşısı

Table 1. Characteristics of included studies on pneumococcal vaccine effectiveness in diabetic patients.

Author, year	Country	Study design	Period	Study sample (n)	Population's conditions	Mean age and standard deviation or age group	Male (%)
Davis TME, 2017 [25]	Australia	Longitudinal prospective cohort study	Enrollment 2008–2011, follow-up until June 2013	1,465 (624 vaccinated; 841 unvaccinated)	Diabetes mellitus (type 2)	65.7 ± 11.6 years	51.9
Kuo CS, 2016 [26]	Taiwan	Population-based retrospective cohort study	2007–2009	66,790 (33,395 vaccinated; 33395 unvaccinated)	Diabetes mellitus (type not specified)	75 years or more	52.1

Table 2. Results of studies on the association between pneumococcal vaccination and the risk of hospitalization or death in diabetic adult patients.

Author, year	Pneumococcal vaccine used	Outcome	Main Result	Adjustment
Davis TME, 2017 [25]	PPV23[a]	Hospitalizations or death due to pneumonia	aHR: 0.76 (95%CI : 0.47-1-26)	GFR[b]; major depression
Kuo CS, 2016 [26]	PPV23[a]	Hospitalizations	aOR: 0.97 (95%CI 0.93–1.01)	age; gender; COPD[c]; flu vaccination; Charlson index; duration of diabetes

Ricciove ark, Expert Review Of Vaccines, 2023

Hepatit B

- <60 yaş için tüm hastalara önerilir
- >60 yaş için bireysel karar verilmesi önerilir

Adults aged ≥60 years with risk factors for hepatitis B:

- Persons at risk for infection by sexual exposure
  - Sex partners of persons testing positive for HBsAg
  - Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months)
  - Persons seeking evaluation or treatment for a sexually transmitted infection
  - Men who have sex with men
- Persons at risk for infection by percutaneous or mucosal exposure to blood
  - Persons with current or recent injection drug use
  - Household contacts of persons testing positive for HBsAg
  - Residents and staff members of facilities for persons with developmental disabilities
  - Health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
  - Persons on maintenance dialysis, including in-center or home hemodialysis and peritoneal dialysis, and persons who are predialysis
  - Persons with diabetes at the discretion of the treating clinician

Updated Recommendations of the Advisory Committee on Immunization Practices, 2022

Table 4—*Studies included in review: demographic data, vaccination schedule, and seroprotection (SP) proportion (anti-HBs cutoff of 10 mIU/mL)*

Authors (reference)	Study population	Age (years)*	Diabetes type	Vaccine	Dose (μg)	Route	Schedule (months)	When seroprotection assessed (months)	Seroprotection proportion	
									Diabetes, % (*n*/*N*)	No diabetes, % (*n*/*N*)
Bouter et al. (14)	Adults	34.3	1	Recombinant	20	IM	0, 1, and 6	1	75.0 (24/32)	96.9 (31/32)
Douvin et al. (13)	Adults	52.4	1 and 2	Engerix-B	20	IM	0, 1, 2, and 12†	1	94.4 (34/36)	NR
		46.0		GenHevac B	20	IM	0, 1, 2, and 12†	1	88.6 (31/35)	NR
Pagani et al. (41)	Adults	50	1 and 2	Haevac B (+thymopentin if diabetes)	5	SC	0, 1, and 2	3	88.2 (15/17)	93.6 (44/47)
Williams et al. (43)	Adults	79.5*	NR	Twinrix	20	IM	0, 1, and 6	1–2	31.3 (10/32)	35.2 (19/54)
Arslanoğlu et al. (30)	Children	10.8	1	Engerix-B‡	10	IM	0, 1, and 6	1–6§	93.9 (93/99)	98.0 (50/51)
Fiçicioğlu et al. (35)	Children	11.5	1	GenHevac B	20	IM	0, 1, and 2 ± 5	2	54.2 (13/24)‖	100.0 (17/17)
Li Volti et al. (38)	Children	8.4	1	Engerix-B	10–20	IM	0, 1, and 6	1	100.0 (9/9)	100.0 (12/12)
		9.8			3	ID	0, 0.5, 1, 1.5–2	1	77.8 (7/9)	100.0 (12/12)
Marseglia et al. (39)	Children	17.3	1	Recombivax HB	10¶	IM	0, 1, and 6	2	95.4 (62/65)	98.3 (171/174)
Chin (31)	HD/CKD	53.7*	NR	Recombivax HB	40	IM	0, 1, and 6**	4–6	52.1†† (25/48)	79.6†† (39/49)
DaRoza et al. (32)#	HD/CKD	59.8*	NR	Recombinant or plasma	40	IM	0, 1, and 6 OR 0, 1, 2, and 6	3	71.7 (33/46)	86.6 (103/119)
Eardley et al. (33)	HD/CKD	61*	NR	HB Vax II	40	IM	0, 1, 2, and 12	1.5–2	66.7 (8/12)	74.3 (55/74)
Fabrizi et al. (34)§§	HD/CKD	63.4*	NR	Engerix-B	40	IM	0, 1, and 2	1	45.8 (11/24)	72.3 (68/94)
Hashemi et al. (36)	HD/CKD	57.4*	NR	Engerix-B	40	IM	0, 1, and 6	2–3	85.3 (29/34)	75.9 (101/133)
Lacson et al. (37)	HD/CKD	59*	NR	Recombivax HB	40	IM	0, 1, and 6	6	NR	NR
				Engerix-B	40	IM	0, 1, 2, and 6	6	NR	NR
Ocak et al. (40)	HD/CKD	61.6*	2	Euvax B ± tetanus toxoid	40	IM	0, 1, 2, and 6 ± 2 OR 3 boosters	2	57.9‖‖ (11/19)	70.0‖‖ (21/30)
Taheri et al. (42)	HD/CKD	50*	NR	Heberbiovac HB	40	IM	0, 1, and 6	1–6	62.2 (23/37)	87.5 (77/88)
Zitt et al. (44)	HD/CKD	64*	NR	HBVaxPro or Engerix-B	40	IM	0, 1, and 6	2	41.8 (23/55)	61.8 (89/144)

Schielle ve ark, Dibetes Care, 2012

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Table 4.4—Highly recommended immunizations for adults with diabetes (Advisory Committee on Immunization Practices and Centers for Disease Control and Prevention)

Vaccine	Recommended ages	Schedule	GRADE evidence type*	References
COVID-19	Recommended for all 6 months of age and older	Current initial vaccination and boosters		Centers for Disease Control and Prevention, Interim Clinical Considerations for Use of COVID-19 Vaccines, 2023 (295)
Hepatitis B	Recommended for adults with diabetes aged <60 years; for adults aged ≥60 years, hepatitis B vaccine may be administered at the discretion of the treating clinician based on the person's likelihood of acquiring hepatitis B infection			Weng et al., Universal Hepatitis B Vaccination in Adults Aged 19–59 Years: Updated Recommendations of the Advisory Committee on Immunization Practices—United States, 2022 (18)
Influenza	All people with diabetes advised not to receive live attenuated influenza vaccine	Annual		Centers for Disease Control and Prevention, Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices—United States, 2023–24 Influenza Season (296)

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Pneumonia (PPSV23 [Pneumovax])	19–64 years of age, vaccinate with Pneumovax	One dose is recommended for those who previously received PCV13; if PCV15 was used, follow with PPSV23 ≥1 year later; PPSV23 is not indicated after PCV20; adults who received only PPSV23 may receive PCV15 or PCV20 ≥1 year after their last dose	2	Centers for Disease Control and Prevention, Updated Recommendations for Prevention of Invasive Pneumococcal Disease Among Adults Using the 23-Valent Pneumococcal Polysaccharide Vaccine (PPSV23) (23)
	≥65 years of age	One dose is recommended for those who previously received PCV13; if PCV15 was used, follow with PPSV23 ≥1 year later; PPSV23 is not indicated after PCV20; adults who received only PPSV23 may receive PCV15 or PCV20 ≥1 year after their last dose	2	Falkenhorst et al., Effectiveness of the 23-Valent Pneumococcal Polysaccharide Vaccine (PPV23) Against Pneumococcal Disease in the Elderly: Systematic Review and Meta-analysis (24)
PCV20 or PCV15	Adults 19–64 years of age, with an immunocompromising condition (e.g., chronic renal failure), cochlear implant, or cerebrospinal fluid leak	One dose of PCV15 or PCV20 is recommended by the Centers for Disease Control and Prevention	3	Kobayashi et al., Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices—United States, 2022 (25)
	19–64 years of age, immunocompetent	For those who have never received any pneumococcal vaccine, the CDC recommends one dose of PCV15 or PCV20		
	≥65 years of age, immunocompetent, have shared decision-making discussion with health care professionals	One dose of PCV15 or PCV20; PCSV23 may be given ≥8 weeks after PCV15; PPSV23 is not indicated after PCV20		

RSV	Older adults ≥60 years of age with diabetes appear to be a risk group	Adults aged ≥60 years may receive a single dose of an RSV vaccine		Centers for Disease Control and Prevention, CDC Recommends RSV Vaccine for Older Adults (29)
Tetanus, diphtheria, pertussis (Tdap)	All adults; pregnant individuals should have an extra dose	Booster every 10 years	2 for effectiveness, 3 for safety	Havers et al., Use of Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccines: Updated Recommendations of the Advisory Committee on Immunization Practices—United States, 2019 (297)
Zoster	≥50 years of age	Two-dose Shingrix, even if previously vaccinated	1	Dooling et al., Recommendations of the Advisory Committee on Immunization Practices for Use of Herpes Zoster Vaccines (298)

3. **Pnömokok aşısı:**

   a. Risk Grubu Aşılamaları genelgesinde immün yetmezlik durumu eşlik etmeyen 65 yaş altındaki diyabet hastalarında tek doz PPA23 aşısının yeterli olduğu belirtilmekle birlikte, öncesinde KPA13 aşısı yapıldığında aşı etkinliğinin arttığı vurgulanmıştır. Bu nedenle immün yetmezlik durumu eşlik etmeyen 65 yaş altındaki DM hastalarına, PPA23 aşısı temin edilemediğinde, vakit kaybetmeden KPA13 yapılması ve bu aşıdan en az 1 yıl sonra PPA23 uygulanması uygun bir yaklaşım olacaktır.

   b. Aşı durumu bilinmiyor ise hiç pnömokok aşısı ile aşılanmamış gibi değerlendirilmelidir. İlk olarak KPA13 ardından en az 1 yıl sonra PPA223 uygulanmalıdır. Bireye daha önce PPA23 uygulanmışsa, KPA13 en az 1 yıl sonra uygulanmalıdır. Birey 65 yaşından önce her iki aşıyı da (KPA13 ve PPA23) olmuş ise 65 yaşından sonra bir doz daha PPA23 uygulanması önerilir. KPA13 65 yaştan önce yapılmışsa tekrarına gerek yoktur, tek dozdur.

TEMD ÖNERİLERİ

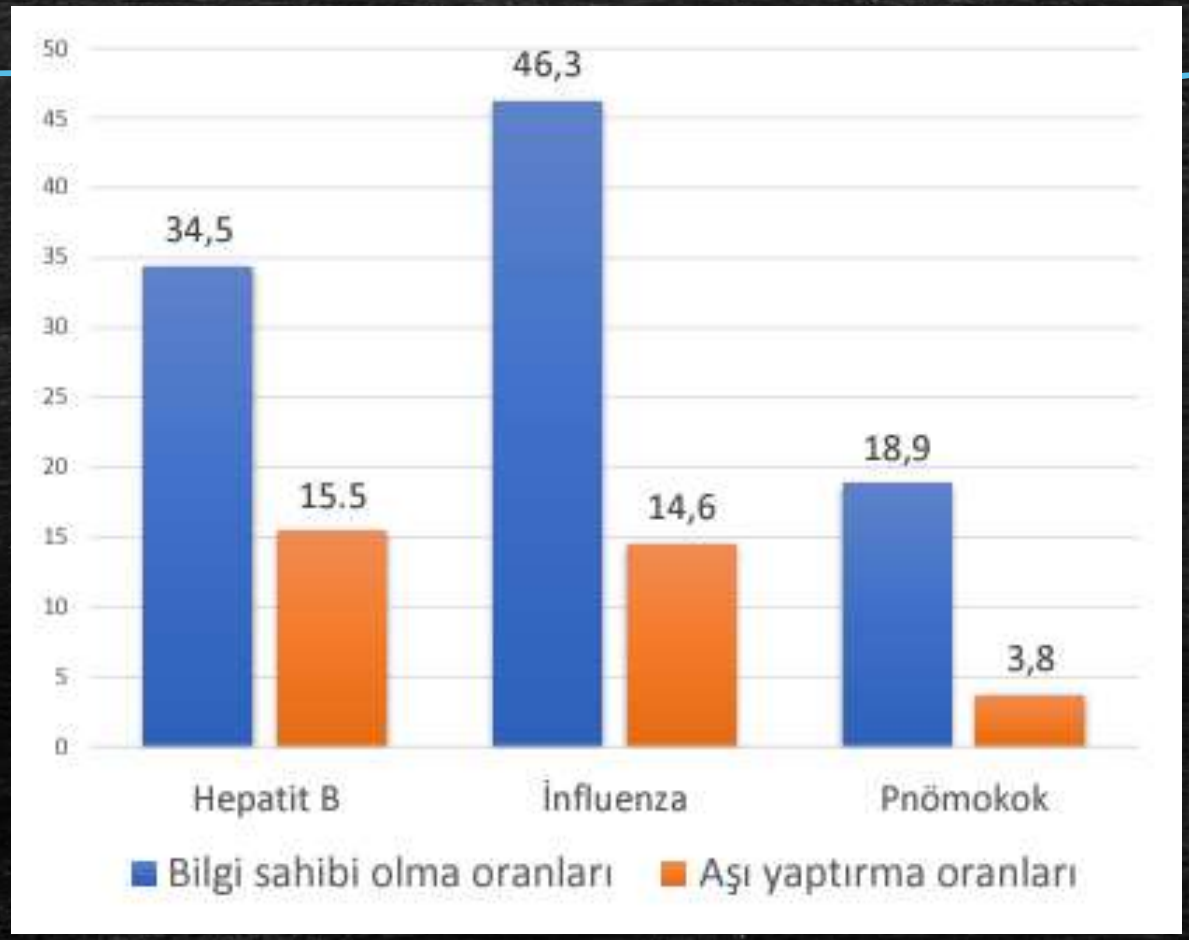
1. Çocukluk çağındaki tip 1 diyabetlilerin rutin aşılama programı sürdürülmelidir (D).
2. Diyabetli bireylerde influenza ve özellikle pnömoni enfeksiyonlarına bağlı komplikasyon riski ve mortalite yüksektir (C).
3. Diyabetli bireylerde influenza ile ilişkili komplikasyonların riskini azaltmak için her yıl (tercihen Ekim-Kasım ayının başında) influenza aşısı yapılmalıdır (B).
4. Diyabetli bireyler de en az diğer kronik hastalıkları olan hastalar kadar pnömokok enfeksiyonlarına yatkındırlar. Bu sebeple aşılanmaları gereklidir (D).
   - 19-64 yaş tüm diyabetlilere, 23 valanlı polisakkarid pnömokok aşısı (PPSV23) uygulanmalıdır, daha güçlü koruma sağlamak amacı ile dual aşılama tercih ediliyorsa önce PCV13, en az 1 yıl sonra PPSV23 önerilir (D).
   - 65 yaş ve üzerinde, önce bir doz PCV13 ve bir yıl sonra bir doz PPSV23 yapılmalıdır. Eğer hasta bu aşıları 65 yaş öncesinde olmuş ve PPSV23 uygulamasının üzerinden 5 yıl geçmişse PPSV23 aşısının tekrarlanması önerilmektedir (D).
   - İmmun baskılanma durumlarında; nefrotik sendrom, kronik böbrek yetersizliği veya transplantasyonlu hastalarda pnömokok aşısı tekrarlanmalıdır (D).
5. Daha önce aşılanmamış olan, 19-59 yaş aralığındaki tüm diyabetlilere HBV aşısı yapılmalıdır (B).
   - 60 yaş ve üzeri diyabetlilerde de HBV aşısı yapılması düşünülebilir.
6. Toplumsal tüm koruma ve eradikasyon programlarına diyabetli kişiler de dahil edilmelidir (D).
7. Endemik bölgelere seyahat edecek diyabetlilere, gidilecek bölgeye göre gerekli aşılamanın yapılması önerilir (D).

AŞILAR	DOZ
İNFLUENZA AŞISI	Her yıl tek doz
PNÖMOKOK AŞISI KPA13 →	Tek doz
PPA23 →	KPA13 den 1 yıl sonra tek doz, Bu uygulama 65 yaş öncesi yapılmışsa, 65 yaş sonrası 1 doz daha tekrarlanır.
HEPATİT B AŞISI	0. Ay ilk doz 1. Ay ikinci doz 6. Ay üçüncü doz

Tablo 2: Erişkinlerde Yaş Gruplarına Göre Aşı Önerileri ve Dozları[6]

Aşı	19-26 yaş	27-36 yaş	37-59 yaş	60-64 yaş	≥65 yaş
Td/Tdap[1,2]	Her 10 yılda bir rapel doz[2]				
İnfluenza	Her yıl 1 doz				
PCV13	1 doz				1 doz
PPSV23	2 doz (5 yıl arayla)				1 doz
Hepatit B[3]	3 doz (0,1,6.ay)				
Hepatit A[3]	2 doz (0,6.ay)				
Zoster				1 doz	
Suçiçeği[3]	2 doz (1 ay arayla)				
KKK[4]	1 veya 2 doz[5]				
Meningokok	1 doz				
Hib	3 doz (4 hafta arayla)				
HPV	3 doz (0,1-2,6.ay)[6]				

Acı Gerçekler



Arslan ve ark, GMJ, 2016

World Journal of Diabetes

Submit a Manuscript: https://www.f6publishing.com

World J Diabetes 2021 December 15; 12(12): 2107-2118

DOI: 10.4239/wjd.v12.i12.2107

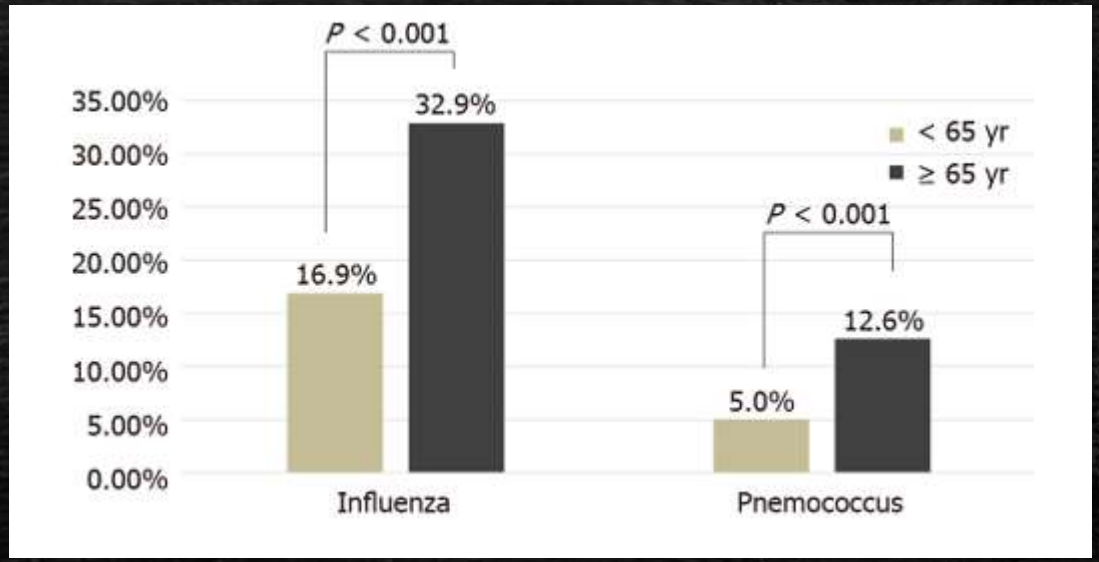
ISSN 1948-9358 (online)

ORIGINAL ARTICLE

Observational Study

Rates and associates of influenza and pneumococcus vaccination in diabetes mellitus: A nationwide cross-sectional study (TEMD vaccination study)

- 37 şehir
- 68 merkez
- 4721 T2D hastası
- 454 T1D hastası

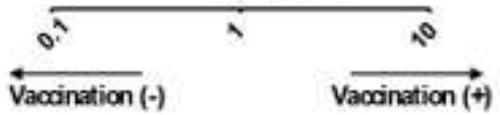


Demirci ve ark, WJD, 2021

Type 1 diabetes

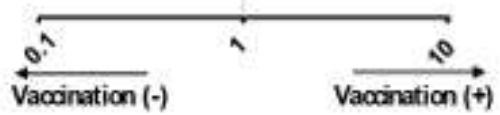
Influenza vaccination

	Odds ratio (95% CI)	*P* value
Gender (female)	1.01 (0.60 - 1.72)	0.961
Age	1.01 (0.99 – 1.04)	0.385
Diabetes duration	1.04 (1.01 – 1.07)	**0.010**
BMI	1.01 (0.95 – 1.08)	0.708
HbA1c	0.89 (0.77 – 1.02)	0.101
Follow-up in private centers	2.44 (1.13 – 5.28)	**0.023**
Smoking	0.52 (0.27 – 0.98)	**0.043**
Dyslipidemia	NA	
LDL-Cholesterol on target	0.60 (0.36 – 1.00)	0.050
Statin use	1.61 (0.79 – 3.32)	0.193



Pneumococcal vaccination

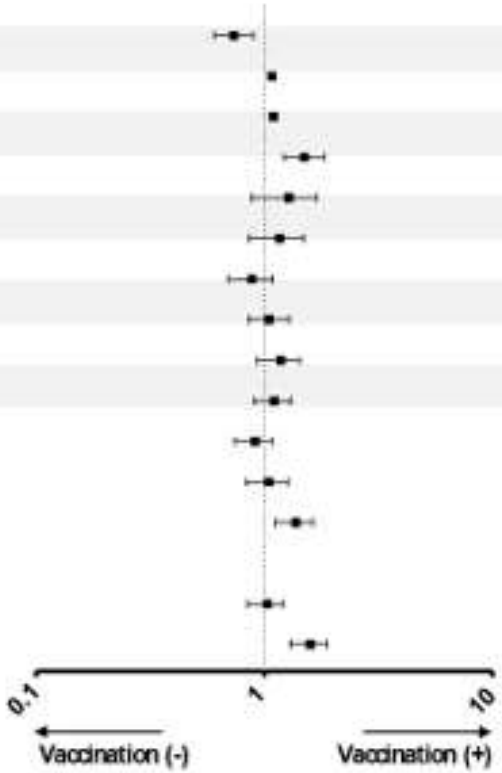
	Odds ratio (95% CI)	*P* value
	0.95 (0.43 – 2.11)	0.892
	1.05 (1.02 – 1.09)	**0.005**
	1.01 (0.97 – 1.05)	0.644
	0.96 (0.87 – 1.06)	0.459
	0.89 (0.72 – 1.12)	0.329
	NA	
	0.66 (0.25 – 1.73)	0.392
	1.59 (0.34 – 7.49)	0.560
	0.48 (0.16 – 1.41)	0.181
	NA	



Type 2 diabetes

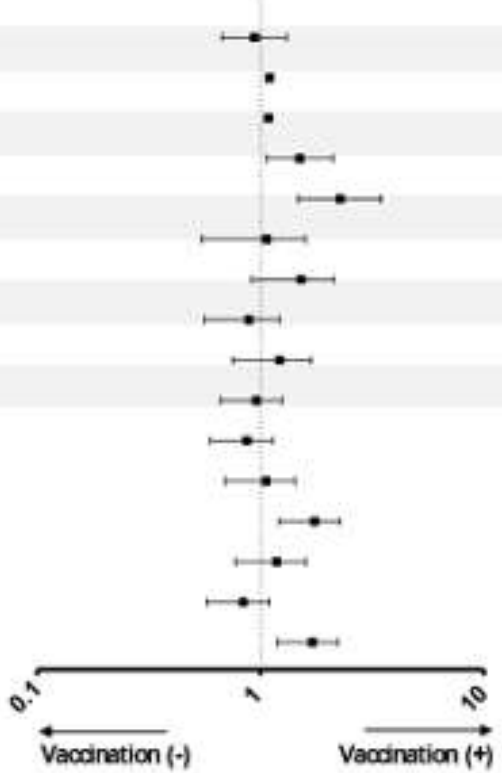
Influenza vaccination

	Odds ratio (95% CI)	*P* value
Gender (female)	0.73 (0.60 - 0.89)	**0.002**
Age	1.03 (1.02 - 1.05)	**<0.001**
Diabetes duration	1.05 (1.03 - 1.06)	**<0.001**
Higher Education	1.50 (1.22 - 1.83)	**<0.001**
Follow-up in Private Centers	1.24 (0.90 - 1.71)	0.193
Smoking	1.14 (0.87 - 1.50)	0.336
Regular excercise	0.88 (0.70 - 1.09)	0.241
Low income	1.05 (0.85 - 1.29)	0.647
Hypertension	1.16 (0.94 - 1.44)	0.171
Obesity	1.09 (0.91 - 1.32)	0.364
Microvascular complications	0.90 (0.75 - 1.09)	0.283
Macrovascular complications	1.03 (0.84 - 1.27)	0.797
HbA1c on target	1.36 (1.13 - 1.64)	**0.001**
BP on target	NA	
LDL on target	1.02 (0.85 - 1.22)	0.864
Statin	1.57 (1.31 - 1.89)	**<0.001**



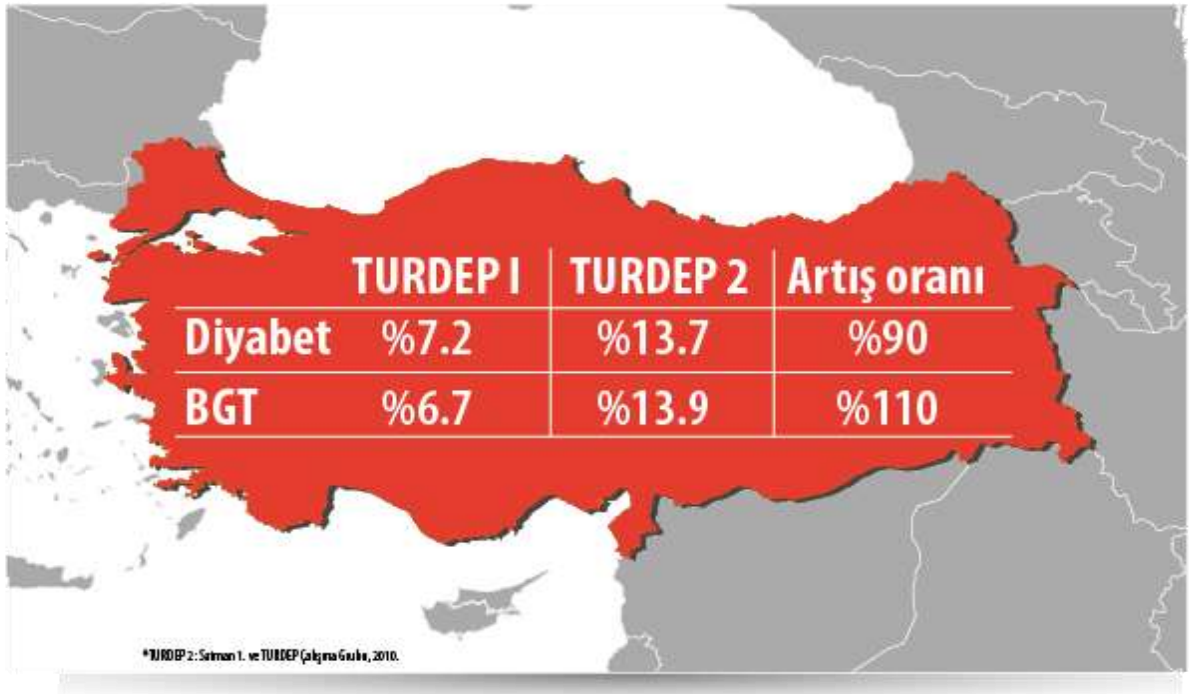
Pneumococcal vaccination

	Odds ratio (95% CI)	*P* value
Gender (female)	0.94 (0.67 - 1.31)	0.307
Age	1.05 (1.03 - 1.07)	**<0.001**
Diabetes duration	1.04 (1.02 - 1.06)	**<0.001**
Higher Education	1.50 (1.06 - 2.12)	**0.021**
Follow-up in Private Centers	2.27 (1.47 - 3.49)	**<0.001**
Smoking	0.98 (0.59 - 1.62)	0.923
Regular excercise	1.44 (0.96 - 2.16)	0.081
Low income	0.85 (0.58 - 1.23)	0.383
Hypertension	1.16 (1.78 - 1.72)	0.477
Obesity	0.93 (0.68 - 1.26)	0.624
Microvascular complications	0.84 (0.61 - 1.15)	0.269
Macrovascular complications	1.02 (0.72 - 1.44)	0.917
HbA1c on target	1.69 (1.24 - 2.30)	**0.001**
BP on target	1.14 (0.80 - 1.61)	0.473
LDL on target	0.81 (0.59 - 1.11)	0.184
Statin	1.65 (1.21 - 2.25)	**0.002**



Diyabet sık görülür

Türkiye Diyabet Epidemiyoloji (TURDEP 2) Çalışması Genel Sonuçları (20 yaş üstüpopülasyonda)



	TURDEP I	TURDEP 2	Artış oranı
Diyabet	%7.2	%13.7	%90
BGT	%6.7	%13.9	%110

*TURDEP 2: Satman I. ve TURDEP Çalışma Grubu, 2010.

TURDEP ÇALIŞMASI

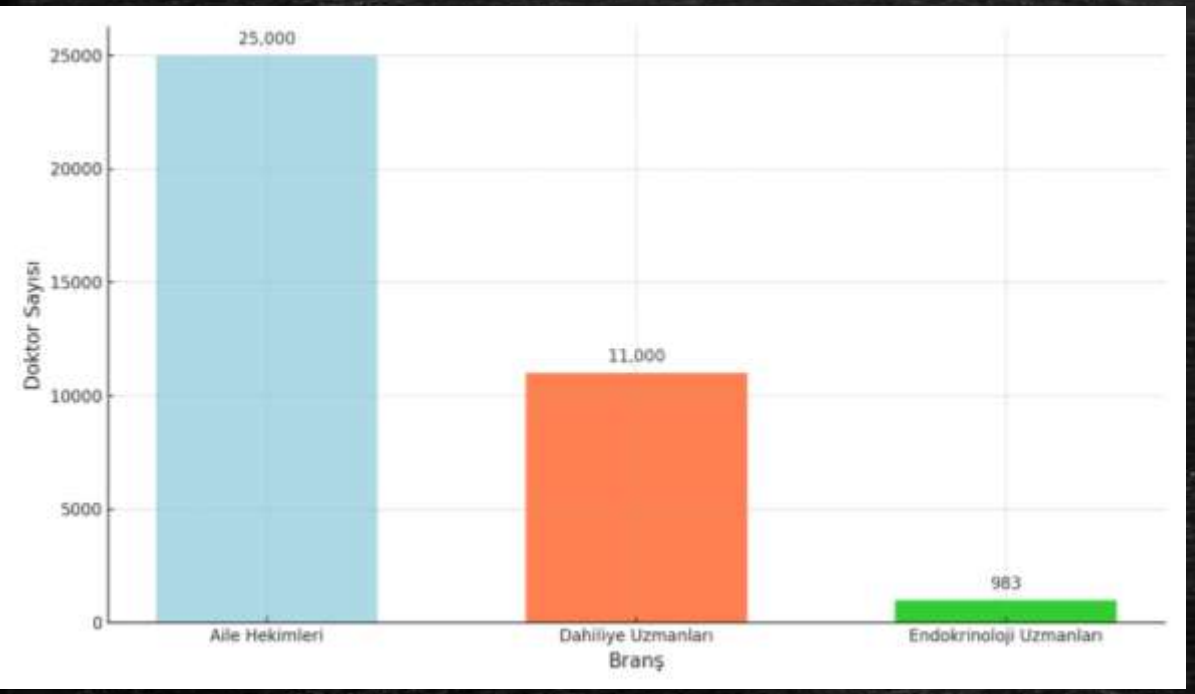
- Turdep 1 → 2001
- Turdep 2 → 2011
- Artış oranı %90
- 2017 yılı prevelans tahmini %16.5

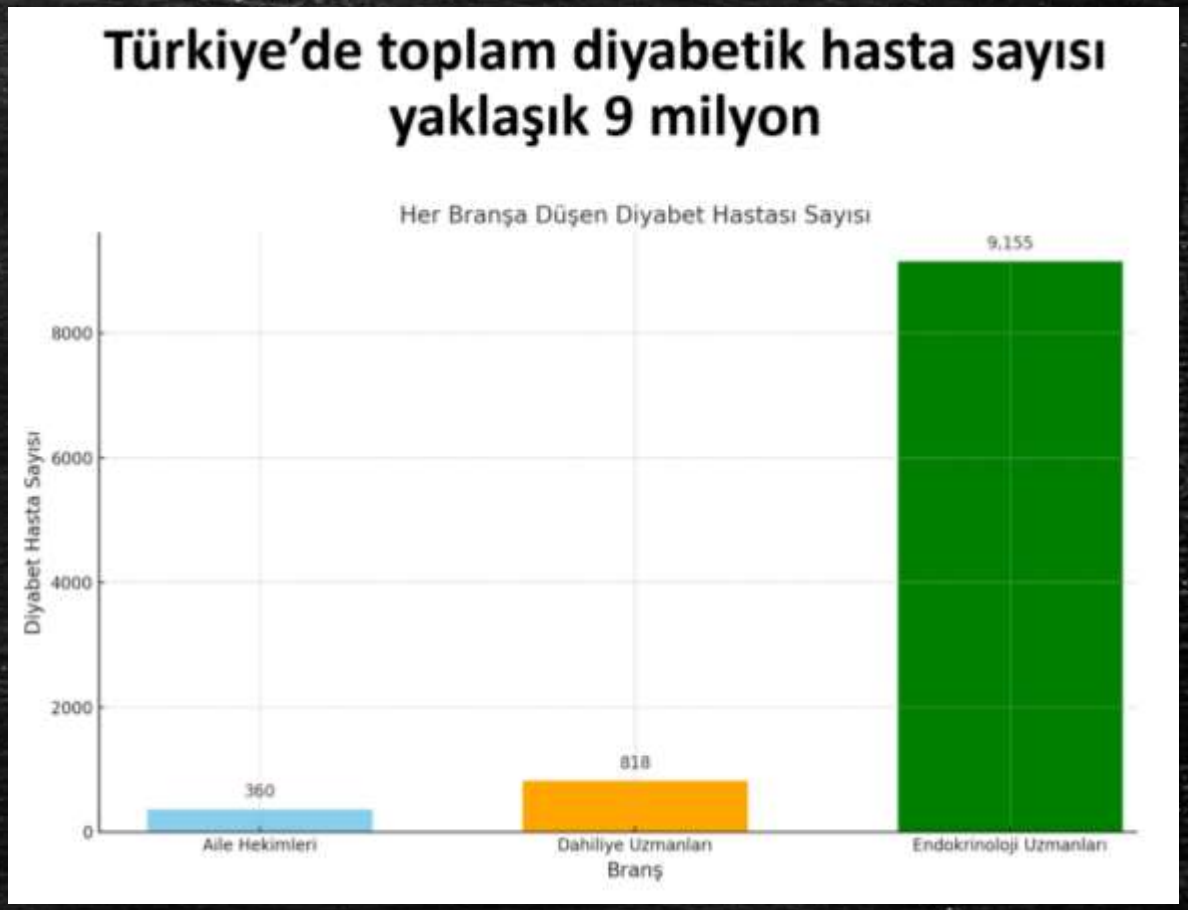
Diyabetli Hastanın Bakım Planı Zahmetlidir

Table 4.1 - Components of the comprehensive diabetes medical evaluation at initial, follow-up, and annual visits

			INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
PAST MEDICAL AND FAMILY HISTORY	**Diabetes history**				
		▪ Characteristics at onset (e.g., age, symptoms)	✓		
		▪ Review of previous treatment plans and response	✓		
		▪ Assess frequency/cause/severity of past hospitalizations	✓		
	Family history				
		▪ Family h	✓		
		▪ Family h			
	Personal hi				
		▪ Commo			
		▪ High blo			
		▪ Macrove			
		▪ Hypogly			
		▪ Presenc			
		▪ Last de			
		▪ Last dil			
		▪ Visits to			
		▪ Disabilit cognitive			
		▪ Persona			
	Interval hist				
		▪ Change			
BEHAVIORAL FACTORS		▪ Eating patterns and weight history	✓	✓	✓
		▪ Assess familiarity with carbohydrate counting (e.g., type 1 diabetes, type 2 diabetes treated with MDI)	✓		✓
		▪ Physical activity and sleep behaviors; screen for obstructive sleep apnea	✓	✓	✓
		▪ Tobacco, alcohol, and substance use	✓		✓
MEDICATIONS AND VACCINATIONS		▪ Current medication plan	✓	✓	✓
		▪ Medication-taking behavior, including rationing of medications and/or medical equipment			
		▪ Medication intolerance			
		▪ Complementary and alt			
		▪ Vaccination history and			
TECHNOLOGY USE		▪ Assess use of health ap			
		▪ Glucose monitoring (me			
		▪ Review insulin pump se			
SOCIAL LIFE ASSESSMENT		**Social network**			
		▪ Identify existing social s			
		▪ Identify surrogate decis			
		▪ Identify social determin stability & homelessnes community safety)			
		▪ Assess daily routine an and ability to engage in			
PHYSICAL EXAMINATION		▪ Height, weight, and BMI; growth/pubertal development in children and adolescents	✓	✓	✓
		▪ Blood pressure determination	✓	✓	✓
		▪ Orthostatic blood pressure measures (when indicated)	✓		
		▪ Fundoscopic examination (refer to eye specialist)	✓		✓
		▪ Thyroid palpation	✓		✓
		▪ Skin examination (e.g., acanthosis nigricans, i insertion sites, lipodystrophy)			
		▪ Comprehensive foot examination			
		▪ Visual inspection (e.g., skin integrity, callo deformity or ulcer, toenails)**			
		▪ Screen for PAD (pedal pulses—refer for AE			
		▪ Determination of temperature, vibration or and 10-g monofilament exam			
		▪ Screen for depression, anxiety, diabetes distre disordered eating			
		▪ Consider assessment for cognitive performan			
		▪ Consider assessment for functional performar			
		▪ Consider assessment for bone pain			
LABORATORY EVALUATION		▪ A1C, if the results are not available within the past 3 months	✓	✓	✓
		▪ If not performed/available within the past year	✓		✓
		▪ Lipid profile, including total, LDL, and HDL cholesterol and triglycerides#	✓		✓
		▪ Liver function tests#	✓		✓
		▪ Spot urinary albumin-to-creatinine ratio	✓		✓
		▪ Serum creatinine and estimated glomerular filtration rate+	✓		✓
		▪ Thyroid-stimulating hormone in people with type 1 diabetes#	✓		✓
		▪ Vitamin B12 if on metformin	✓		✓
		▪ Complete blood count (CBC) with platelets	✓		✓
		▪ Serum potassium levels in people with diabetes on ACE inhibitors, ARBs, or diuretics+	✓		✓
		▪ Calcium, vitamin D, and phosphorous for appropriate people with diabetes	✓		✓

Ülkemizde Doktor Sayısı Çok da fazla değil





Son Söz..

- Diyabetli bireylerde enfeksiyöz komplikasyonlar artmıştır
- Önlem stratejileri arasında aşılama önemli yer tutar
  - Farkındalık
  - Uygulama

TÜRKİYE ENDOKRİNOLOJİ VE METABOLİZMA DERNEĞİ

OBEZİTE TANI ve TEDAVİ KILAVUZU
(2024)

DIABETES MELLITUS VE KOMPLİKASYONLARININ TANI, TEDAVİ VE İZLEM KILAVUZU
(2024)

TİROİD VE PARATİROİD LEZYONLARINDA GİRİŞİMSEL İŞLEMLER VE ABLASYON TEDAVİLERİ KILAVUZU
(2023)

TIBBİ BESLENME ve EGZERSİZ METABOLİZMASI KILAVUZU
(2023)

TİROİD HASTALIKLARI TANI VE TEDAVİ KILAVUZU
(2023)

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(2022)

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(2022)

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(2022)

DİSLİPİDEMİ TANI VE TEDAVİ KILAVUZU
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BARİYATRİK CERRAHİ
(2019)

İlginize Teşekkür Ederim..