

Supplementary Table 1 General composition of the sample by residential area (urban vs rural)

	Urban No. (%)	Rural No. (%)	Total No. (%)
All participants	6456 (74.4)	2226 (25.6)	8682 (100.0)
Iranian participants	6093 (73.9)	2155 (26.1)	8248 (100.0)
Non-Iranian participants	363 (83.6)	71 (16.4)	434 (100.0)
Participants with full vaccination schedule	6265 (74.1)	2195 (25.9)	8460 (100.0)
Iranian participants with full vaccination schedule	5938 (73.6)	2130 (26.4)	8068 (100.0)
Non-Iranian participants with full vaccination schedule	327 (83.4)	65 (16.6)	392 (100.0)

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Supplementary Table 2 Age distribution of the whole sample in percentiles by nationality

	Iranians (n = 8248)		Non-Iranians (n = 434)	
	Age (days)	Age (years)	Age (days)	Age (years)
Mean	903.92	2.48	899.57	2.46
Standard deviation	112.50	0.31	110.04	0.30
Percentiles	1st	727	729	2.00
	5th	739	739	2.02
	10th	754	758	2.08
	25th	805	801	2.19
	50th	899	894	2.45
	75th	1,000.5	991	2.72
	90th	1,062	1,052	2.88
	95th	1,082	1,081	2.96
99th	1,106	3.03	1,143	3.13
Youngest	525	1.44	704	1.93
Oldest	1,379	3.78	1,220	3.34

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Supplementary Table 3 Sex distribution of participants by province and nationality

Province	Female No. (%)	Male No. (%)	Female No. (%)	Male No. (%)
Alborz	141 (50.36)	139 (49.64)	17 (65.38)	9 (34.62)
Ardebil	59 (42.75)	79 (57.25)	–	–
West Azerbaijan	160 (47.62)	176 (52.38)	–	–
East Azerbaijan	202 (46.12)	236 (53.88)	–	–
Bushehr	47 (42.34)	64 (57.66)	1 (33.33)	2 (66.67)
Chaharmahal and Bakhtiari	42 (43.75)	54 (56.25)	–	–
Isfahan	266 (51.25)	253 (48.75)	23 (40.35)	34 (59.65)
Fars	239 (48.38)	255 (51.62)	12 (54.55)	10 (45.45)
Guilan	148 (48.37)	158 (51.63)	–	–
Golestan	91 (46.91)	103 (53.09)	2 (50)	2 (50)
Kohgiluyeh and Boyer-Ahmad	32 (48.48)	34 (51.52)	–	–
Hamedan	85 (44.27)	107 (55.73)	–	–
Hormozgan	83 (46.89)	94 (53.11)	2 (66.67)	1 (33.33)
Ilam	27 (45.00)	33 (55.00)	–	–
Kerman	146 (48.03)	158 (51.97)	15 (46.88)	17 (53.13)
Kermanshah	107 (50.95)	103 (49.05)	–	–
Khuzestan	207 (44.81)	255 (55.19)	–	–
Southern Khorasan	37 (48.68)	39 (51.32)	1 (50)	1 (50)
Khorasan Razavi	312 (46.09)	365 (53.91)	10 (52.63)	9 (47.37)
Northern Khorasan	43 (47.78)	47 (52.22)	–	–
Kurdistan	64 (38.1)	104 (61.9)	–	–
Lorestan	88 (48.89)	92 (51.11)	–	–
Markazi	67 (42.14)	92 (57.86)	1 (33.33)	2 (66.67)
Mazandaran	185 (47.80)	202 (52.20)	0	3 (100)
Qazvin	62 (44.60)	77 (55.40)	5 (100)	0
Qom	53 (44.54)	66 (55.46)	8 (42.11)	11 (57.89)
Sistan-va-Baluchestan	102 (43.78)	131 (56.22)	8 (42.11)	11 (57.89)
Semnan	37 (56.92)	28 (43.08)	2 (15.38)	11 (84.62)
Tehran	629 (46.91)	712 (53.09)	80 (39.8)	121 (60.2)
Yazd	56 (47.86)	61 (52.14)	1 (33.33)	2 (66.67)
Zanjan	47 (41.23)	67 (58.77)	–	–
Total	3,864 (46.85)	4,384 (53.15)	188 (43.32)	246 (56.68)

Supplementary Table 4 Distribution of the sample in provinces with non-Iranian participants

Province	Iranians No. Row % Column % (of 8284)	Non-Iranians No. Row % Column % (of 434)
Tehran	1341 86.96 16.26	201 13.04 46.31
Isfahan	519 90.10 6.29	57 9.90 13.13
Kerman	304 90.48 3.69	32 9.52 7.37
Alborz	280 91.50 3.39	26 8.50 5.99
Fars	494 95.74 5.99	22 4.26 5.07
Khorasan Razavi	677 97.27 8.21	19 2.73 4.38
Qom	119 86.23 1.44	19 13.77 4.38
Sistan-va-Baluchestan	233 92.46 2.82	19 7.54 4.38
Semnan	65 83.33 0.79	13 16.67 3.00
Qazvin	139 96.53 1.69	5 3.47 1.15
Seven other provinces ^a	1,221 98.28 14.8	21 1.72 4.84

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^aBushehr, Golestan, Hormozgan, Southern Khorasan, Markazi, Mazandaran, and Yazd.

Supplementary Table 5 Vaccination card ownership and presentation by nationality and residential area (urban vs rural)

Card ownership and presentation during household interviews	Urban (only Iranians) No. (%)	Rural (only Iranians) No. (%)	Non-Iranians No. (%)	Total No. (%)
Present the card	5612 (92.11)	2067 (95.92)	397 (91.47)	8076 (93.02)
Have the card but cannot present it	452 (7.42)	69 (3.2)	32 (7.37)	553 (6.37)
Have lost the card	25 (0.41)	16 (0.74)	5 (1.15)	46 (0.53)
Do not have any card at all	4 (0.07)	3 (0.14)	0 (0)	7 (0.08)
Total	6093 (100)	2155 (100)	434 (100)	8682 (100)

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Supplementary Table 6 Contributions of public and private sectors to immunization coverage of the Iranian participants

Provinces	Public sector No. (%)	Private offices No. (%)	Private clinics & hospitals No. (%)	Total No. (%)
Alborz	278 (99.29)	0 (0)	2 (0.71)	280 (100)
Isfahan	518 (99.81)	1 (0.19)	0 (0)	519 (100)
Fars	493 (99.8)	0 (0)	1 (0.2)	494 (100)
Guilan	304 (99.35)	0 (0)	2 (0.65)	306 (100)
Ilam	59 (98.33)	0 (0)	1 (1.67)	60 (100)
Khuzestan	457 (98.92)	0 (0)	5 (1.08)	462 (100)
Khorasan Razavi	674 (99.56)	2 (0.3)	1 (0.15)	677 (100)
Lorestan	175 (97.22)	0 (0)	5 (2.78)	180 (100)
Qazvin	138 (99.28)	1 (0.72)	0 (0)	139 (100)
Sistan-va-Baluchestan	231 (99.14)	1 (0.43)	1 (0.43)	233 (100)
Tehran	1,309 (97.61)	22 (1.64)	10 (0.75)	1,341 (100)
Yazd	116 (99.15)	0 (0)	1 (0.85)	117 (100)
The other 19 provinces	3,440 (100)	0 (0)	0 (0)	3,440 (100)
Total	8,192 (99.32)	27 (0.33)	29 (0.35)	8,248 (100)

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Supplementary Table 7 Proportion of the fully immunized participants by province, number and proportion of samples completed based on ICHIS data, and nationality

Provinces	Iranian Participants No.	Fully immunized Iranians No (%)	Records retrieved from ICHIS system No. (%)	Non-Iranians Participants No.	Fully immunized Non-Iranians participants No (%)	Records retrieved from ICHIS system No. (%)
Alborz	280	277 (98.9)	14 (5.0)	26	26 (100.0)	0(0.0)
Ardebil	138	137 (99.3)	13 (9.4)	3	2 (66.7)	0(0.0)
West Azerbaijan	336	333 (99.1)	4 (1.2)	—	—	—
East Azerbaijan	438	434 (99.1)	19 (4.3)	—	—	—
Bushehr	111	110 (99.1)	4 (3.6)	—	—	—
Chaharmahal and Bakhtiari	96	96 (100.0)	8 (8.3)	—	—	—
Isfahan	519	519 (100.0)	66 (12.7)	57	57 (100.0)	2 (2.5)
Fars	494	490 (99.2)	16 (3.2)	22	22 (100.0)	0(0.0)
Guilan	306	302 (98.7)	3 (1.0)	—	—	—
Golestan	194	190 (97.9)	17 (8.8)	4	2 (50.0)	1 (25.0)
Kohgiluyeh and Boyer-Ahmad	66	66 (100.0)	9 (13.6)	—	—	—
Hamedan	192	190 (99.0)	4 (2.1)	—	—	—
Hormozgan	177	172 (97.2)	6 (3.4)	3	3 (100.0)	0(0.0)
Ilam	60	59 (98.3)	0 (0.0)	—	—	—
Kerman	304	298 (98.0)	21 (6.9)	32	31 (96.9)	0(0.0)
Kermanshah	210	206 (98.1)	3 (1.4)	—	—	—
Khuzestan	462	454 (98.3)	30 (6.5)	—	—	—
Southern Khorasan	76	72 (94.7)	7 (9.2)	2	2 (100.0)	—
Khorasan Razavi	677	675 (99.7)	46 (6.8)	19	19 (100.0)	3 (15.8)
Northern Khorasan	90	87 (96.7)	2 (2.2)	—	—	—
Kurdistan	168	167 (99.4)	2 (1.2)	—	—	—
Lorestan	180	179 (99.4)	3 (1.7)	—	—	—
Markazi	159	159 (100.0)	8 (5.0)	3	2 (66.7)	1 (33.3)
Mazandaran	387	383 (99.0)	33 (8.5)	3	2 (66.7)	0(0.0)
Qazvin	139	138 (99.3)	11 (7.9)	5	5 (100.0)	0(0.0)
Qom	119	111 (93.3)	11 (9.2)	19	15 (79.0)	2 (10.5)
Sistan-va-Baluchestan	233	221 (94.9)	4 (1.7)	19	13 (68.4)	0(0.0)
Semnan	65	65 (100.0)	3 (4.6)	13	12 (92.3)	1 (7.7)
Tehran	1,341	1,251 (93.3)	147 (11.0)	201	176 (87.6)	9 (4.5)
Yazd	117	113 (96.6)	0 (0.0)	3	3 (100.0)	0(0.0)
Zanjan	114	114 (100.0)	2 (1.8)	—	—	—
Total	8,248	8,068 (97.8)	516 (6.3)	434	392 (90.3)	19(4.4)

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Supplementary Table 8 Vaccination coverage of the Iranian participants by vaccine and their residential area

Iranian participants	Urban = 6093	Rural = 2155	Total = 8248
	No. % of 6093	No. % of 2155	No. % of 8248
Children with BCG record on their cards	6,005 98.6	2,155 99.8	8,156 98.9
Children with at-birth OPV on their cards	6,000 98.5	2,148 99.7	8,148 98.8
Children with hepatitis B vaccine record on their cards	6,003 98.5	2,149 99.7	8,152 98.8
Children with 1st OPV record on their cards (scheduled for 2nd month of age)	6,028 98.9	2,154 99.9	8,182 99.2
Kids with 2nd OPV record on their cards (scheduled for 4th month of age)	6,022 98.8	2,152 99.9	8,174 99.1
Kids with 3rd OPV record on their cards (scheduled for 6th month of age)	6,024 98.9	2,152 99.9	8,176 99.1
Kids with 1st booster dose of OPV record on their cards (scheduled for 18th month of age)	5,994 98.4	2,143 99.4	8,137 98.65
Kids with 1st pentavalent record on their cards (scheduled for 2nd month of age)	6,028 98.9	2,154 99.9	8,182 99.2
Kids with 2nd pentavalent record on their cards (scheduled for 4th month of age)	6,022 98.8	2,152 99.9	8,174 99.1
Kids with 3rd pentavalent record on their cards (scheduled for 6th month of age)	6,024 98.9	2,152 99.9	8,176 99.1
Kids with 1st booster dose of DTP record on their cards (scheduled for 18th month of age)	5,995 98.4	2,143 99.4	8,138 98.7
Kids with 1st dose of MMR record on their cards (scheduled for 12th month of age)	6,017 98.8	2,152 99.9	8,169 99.0
Kids with 2nd dose of MMR record on their cards (scheduled for 18th month of age)	5,996 98.4	2,144 99.5	8,140 98.7

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Supplementary Table 9 Vaccination coverage of non-Iranians participants by vaccine and residential area

Foreign refugees	Urban = 363 No. (% of 363)	Rural = 71 No. (% of 71)	Total = 434 No. (% of 434)
Children with BCG record on their cards	341 (93.94)	67 (94.37)	408 (94.01)
Children with at-birth polio record on their cards	337 (92.84)	67 (94.37)	404 (93.09)
Children with hepatitis-B vaccine record on their cards	340 (93.66)	67 (94.37)	407 (93.78)
Children with 1st OPV record on their cards (scheduled for 2nd month of age)	341 (93.94)	69 (97.18)	410 (94.47)
Children with 2nd OPV record on their cards (scheduled for 4th month of age)	342 (94.21)	69 (97.18)	411 (94.7)
Children with 3rd OPV record on their cards (scheduled for 6th month of age)	342 (94.21)	68 (95.77)	410 (94.47)
Children with 1st booster dose of OPV record on their cards (scheduled for 18th month of age)	341 (93.94)	66 (92.96)	407 (93.78)
Children with 1st Penta-valan record on their cards (scheduled for 2nd month of age)	341 (93.94)	69 (97.18)	410 (94.47)
Children with 2nd Penta-valan record on their cards (scheduled for 4th month of age)	342 (94.21)	69 (97.18)	411 (94.7)
Children with 3rd Penta-valan record on their cards (scheduled for 6th month of age)	342 (94.21)	68 (95.77)	410 (94.47)
Children with 1st booster dose of DTP record on their cards (scheduled for 18th month of age)	339 (93.39)	66 (92.96)	405 (93.32)
Children with 1st dose of MMR record on their cards (scheduled for 12th month of age)	344 (94.77)	68 (95.77)	412 (94.93)
Children with 2nd dose of MMR record on their cards (scheduled for 18th month of age)	341 (93.94)	67 (94.37)	408 (94.01)

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Supplementary Table 10 Age distribution of the Iranian participants at the time of administration of each vaccine

Vaccine Name	Mean (SD) days	Percentiles (days)									Observations 8156
		1 st	5 th	10 th	25 th	50 th	75 th	90 th	95 th	99 th	
BCG	1.67 (5.8)	0	0	0	0	1	1	3	6	21	8148
OPV at birth	1.68 (4.71)	0	0	0	0	1	1	3	5	18	8152
Hepatitis B	1.18 (4.36)	0	0	0	0	1	1	2	4	14	8182
1st OPV	63.53 (12.29)	59	60	60	61	62	64	67	70	89	8182
1st pentavalent	63.57 (12.97)	59	60	60	61	62	64	67	70	89	8174
2nd OPV	125.6 (11.46)	119	120	121	122	124	126	131	136	158	8174
2nd pentavalent	125.64 (12.21)	119	120	121	122	124	126	131	136	158	8176
3rd OPV	188.7 (22.17)	180	181	182	183	185	189	195	203	242	8176
3rd pentavalent	188.7 (22.18)	180	181	182	183	185	189	195	203	242	8137
1st OPV booster	557.35 (23.63)	543	546	548	549	552	558	569	581	644	8138
DTP	557.61 (25.2)	542	546	548	549	552	558	569	581	648	8169
1st MMR	373.38 (21.47)	361	365	366	367	369	373	382	391	456	8140
2nd MMR	557.94 (25.78)	542	546	548	549	552	558	569	582	679	8156

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Supplement Table 11 Distribution of age at the time of administration of at-birth hepatitis B vaccine to Iranians by province

Provinces	Within 1st 24 h No. (%)	Days 2–7 No. (%)	> 7 days No. (%)	No record or not vaccinated No. (%)	Total No. (%)
Alborz	264 (94.29)	10 (3.57)	3 (1.07)	3 (1.07)	280 (100)
Ardebil	125 (90.58)	9 (6.52)	4 (2.9)	0 (0)	138 (100)
West Azerbaijan	327 (97.32)	6 (1.79)	3 (0.89)	0 (0)	336 (100)
East Azerbaijan	425 (97.03)	5 (1.14)	6 (1.37)	2 (0.46)	438 (100)
Bushehr	107 (96.4)	4 (3.6)	0 (0)	0 (0)	111 (100)
Chaharmahal and Bakhtiari	92 (95.83)	3 (3.13)	1 (1.04)	0 (0)	96 (100)
Isfahan	497 (95.76)	13 (2.5)	9 (1.73)	0 (0)	519 (100)
Fars	313 (63.36)	145 (29.35)	34 (6.88)	2 (0.4)	494 (100)
Guilan	291 (95.1)	8 (2.61)	6 (1.96)	1 (0.33)	306 (100)
Golestan	182 (93.81)	4 (2.06)	8 (4.12)	0 (0)	194 (100)
Kohgiluyeh and Boyer-Ahmad	57 (86.36)	8 (12.12)	1 (1.52)	0 (0)	66 (100)
Hamedan	187 (97.4)	2 (1.04)	2 (1.04)	1 (0.52)	192 (100)
Hormozgan	156 (88.14)	10 (5.65)	6 (3.39)	5 (2.82)	177 (100)
Ilam	56 (93.33)	2 (3.33)	1 (1.67)	1 (1.67)	60 (100)
Kerman	271 (89.14)	21 (6.91)	11 (3.62)	1 (0.33)	304 (100)
Kermanshah	183 (87.14)	16 (7.62)	9 (4.29)	2 (0.95)	210 (100)
Khuzestan	402 (87.01)	42 (9.09)	17 (3.68)	1 (0.22)	462 (100)
Southern Khorasan	65 (85.53)	6 (7.89)	2 (2.63)	3 (3.95)	76 (100)
Khorasan Razavi	645 (95.27)	19 (2.81)	13 (1.92)	0 (0)	677 (100)
Northern Khorasan	86 (95.56)	1 (1.11)	2 (2.22)	1 (1.11)	90 (100)
Kurdistan	164 (97.62)	3 (1.79)	1 (0.6)	0 (0)	168 (100)
Lorestan	178 (98.89)	1 (0.56)	1 (0.56)	0 (0)	180 (100)
Markazi	151 (94.97)	7 (4.4)	1 (0.63)	0 (0)	159 (100)
Mazandaran	358 (92.51)	18 (4.65)	10 (2.58)	1 (0.26)	387 (100)
Qazvin	138 (99.28)	1 (0.72)	0 (0)	0 (0)	139 (100)
Qom	113 (94.96)	1 (0.84)	2 (1.68)	3 (2.52)	119 (100)
Sistan-va-Baluchestan	195 (83.69)	17 (7.3)	21 (9.01)	0 (0)	233 (100)
Semnan	65 (100)	0 (0)	0 (0)	0 (0)	65 (100)

Supplement Table 11 Distribution of age at the time of administration of at-birth hepatitis B vaccine to Iranians by province (concluded)

Provinces	Within 1st 24 h No. (%)	Days 2–7 No. (%)	> 7 days No. (%)	No record or not vaccinated No. (%)	Total No. (%)
Tehran	1,203 (89.71)	41 (3.06)	28 (2.09)	69 (5.15)	1,341 (100)
Yazd	112 (95.73)	3 (2.56)	2 (1.71)	0 (0)	117 (100)
Zanjan	109 (95.61)	4 (3.51)	1 (0.88)	0 (0)	114 (100)
Total	7,517 (91.14)	430 (5.21)	205 (2.49)	96 (1.16)	8,248 (100)

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Supplementary Table 12 Distribution of age at the time of administration of at-birth hepatitis B vaccine by nationality and residential area (of Iranians)

Age of administration of 1st hepatitis B vaccine	Urban (only Iranians) No. (%)	Rural (only Iranians) No. (%)	Non-Iranian refugees No. (%)	Total No. (%)
Within 1st 24 h	5535 (90.84)	1982 (91.97)	332 (76.5)	7849 (90.41)
Days 2–7	325 (5.33)	105 (4.87)	54 (12.44)	484 (5.57)
> 7 days	143 (2.35)	62 (2.88)	21 (4.84)	226 (2.6)
No record or not vaccinated	90 (1.48)	6 (0.28)	27 (6.22)	123 (1.42)
Total	6093 (100)	2155 (100)	434 (100)	8682 (100)

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