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Supplementary appendix

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Appendix

Supplementary Table 1: Description of the UK refugee technical instructions (UKREF TI) and the UK immunisation schedule for key diseases

Disease	UKREF TI	UK immunisation schedule
Polio	At least one dose of oral polio vaccine (OPV) or inactivated polio vaccine (IPV), depending on the type of circulating polio and vaccine availability	2 months – 3 years: 3 doses, Age 3+ years: 4 doses
Measles	At least one dose, preferably measles, mumps and rubella (MMR) to all refugees older than 9 months	1-3 years :1 dose, Age 3+ years: 2 doses
Mumps	N/A	1-3 years old: 1 dose 3+ years old: 2 doses
Rubella	N/A	1-3 years: 1 dose, 3+ years old: 2 doses
Diphtheria/Tetanus	N/A	2 months – 3 years: 3 doses, 3+ years old: 4 doses
Pertussis	N/A	2 months – 3 years: 3 doses 3 years old: 4 doses

Hepatitis B	To close contacts of identified cases	2 months+: 3 doses
Rotavirus	Advised if living in crowded conditions	2 months+: 2 doses
Varicella	Advised if living in crowded conditions	NA
Meningococcal	Advised if living in crowded conditions	MenB/2 months-1 year: 3 doses, MenC/1+ years: 1 dose, MenACWY/14+ years: 1 dose
Pneumococcal	N/A	2 months – 1 year: 2 doses
Hib	Advised if living in crowded conditions	2 months – 1 year: 3 doses

Appendix Supplementary Table 2. Count of doses given during IOM migration health assessments, by vaccine type, region and country of health assessment and age category.

	IPV	OPV	MMR	Measles	Mumps	Rubella	Td	DTaP	Tdap	DTP	HepB	Meningococcal	Hexavalent	Hib	Varicella	Influenza	PCV13	Other MCV	Pentacel	All vaccines
Total doses	1549	8251	8741	243	3	2	46	7	1143	84	4529	1429	44	3	9	28	1	5	1	26118
Region/Country of health assessment																				
Eastern Med	89	7427	6199	241	1	0	0	0	0	84	3717	759	1	1	0	2	0	0	0	18521
Afghanistan	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Syria	0	255	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	257
Egypt	0	1068	727	0	0	0	0	0	0	0	1236	710	0	0	0	0	0	0	0	3741
Sudan	23	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	24
Lebanon	66	3305	3233	0	0	0	0	0	0	0	1594	9	0	0	0	0	0	0	0	8207
Iran	0	197	198	0	1	0	0	0	0	0	119	0	0	0	0	0	0	0	0	515
Iraq	0	1242	1178	0	0	0	0	0	0	2	186	11	1	1	0	2	0	0	0	2623
Jordan	0	1359	863	241	0	0	0	0	0	82	579	29	0	0	0	0	0	0	0	3153
Europe	1197	0	1465	0	0	0	29	7	1143	0	429	655	36	2	0	0	0	0	1	4964
Greece	82	0	39	0	0	0	29	1	51	0	0	60	1	0	0	0	0	0	0	263
Turkey	1115	0	1426	0	0	0	0	6	1092	0	429	595	35	2	0	0	0	0	1	4701
Africa	248	789	993	2	2	2	0	0	0	0	379	0	0	0	1	1	0	0	0	2417
Niger	0	161	153	0	0	0	0	0	0	0	72	0	0	0	1	0	0	0	0	387
Kenya	243	474	686	0	2	0	0	0	0	0	279	0	0	0	0	1	0	0	0	1685
Burundi	5	154	154	2	0	2	0	0	0	0	28	0	0	0	0	0	0	0	0	345
Asia	0	35	60	0	0	0	0	0	0	0	3	13	0	0	0	0	0	0	0	111
Sri Lanka	0	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

Thailand	0	22	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
India	0	5	25	0	0	0	0	0	0	0	3	13	0	0	0	0	0	0	0	46
Pacific	15	0	24	0	0	0	17	0	0	0	1	2	7	0	8	25	1	5	0	105
Malaysia	15	0	24	0	0	0	17	0	0	0	1	2	7	0	8	25	1	5	0	105
Age range																				
Child (<10 years)	310	2124	2103	45	2	1	0	3	199	84	2213	621	43	3	4	11	1	0	1	7768
Adolescent (10-19 years)	444	1953	2134	63	0	0	36	1	346	0	2135	646	1	0	5	7	0	5	0	7776
Adult >19 years)	795	4174	4504	135	1	1	10	3	598	0	181	162	0	0	0	10	0	0	0	10574

Definitions: IPV: Inactivated polio vaccine, OPV: oral polio vaccine, MMR: measles-mumps-rubella, Td: Tetanus-diphtheria, DTaP/DTP/Tdap: tetanus-diphtheria-pertussis, HepB: hepatitis B, Hexavalent: diphtheria-tetanus-pertussis-polio-hepatitis B-Hib, Hib: *Haemophilus influenzae B*, PCV13: pneumococcus, Other MCV: meningococcus, Pentacel: diphtheria-tetanus-pertussis-polio-Hib

Appendix Supplementary Table 3. Count of refugees immunised with at least one dose of key vaccines, by age category and region of health assessment

Characteristic	N in cohort	Refugees immunised with at least one dose, n (%)											
		Polio	Measles	Mumps	Rubella	Diphtheria-tetanus	Pertussis	Hepatitis B	Rotavirus	Varicella	Meningococcus	Pneumococcus	Hib
Total	6870	5798 (84.4)	5556 (80.9)	5485 (79.8)	5484 (79.8)	1315 (19.1)	1193 (17.4)	2809 (40.9)	186 (2.7)	32 (0.5)	726 (10.6)	98 (1.4)	527 (7.7)
Age													
Child (<10)	2195	1936 (88.2)	1738 (89.8)	1705 (88.1)	1704 (88.0)	758 (39.2)	753 (38.9)	1717 (88.7)	186 (9.6)	27 (1.4)	308 (15.9)	96 (5.0)	488 (25.2)
Adolescent (10-19)	1438	1190 (82.8)	1181 (82.1)	1163 (80.9)	1163 (80.9)	241 (16.8)	183 (12.7)	1000 (69.5)	0 (0)	5 (0.3)	322 (22.4)	0 (0)	36 (2.5)
Adult (>19)	3237	2672 (82.6)	2637 (81.5)	2617 (80.8)	2617 (80.8)	316 (9.8)	257 (7.9)	92 (2.8)	0 (0)	0 (0)	96 (3.0)	2 (0.06)	3 (0.09)
Region of Health Assessment													
Eastern Mediterranean	5561	4585 (82.5)	4378 (78.7)	4306 (77.4)	4306 (77.4)	719 (12.9)	626 (11.3)	2386 (42.9)	161 (2.9)	4 (0.07)	385 (6.9)	57 (1.0)	410 (7.4)
Europe	669	590 (88.2)	580 (86.7)	580 (86.7)	580 (86.7)	552 (82.5)	533 (79.7)	216 (32.3)	1 (0.1)	24 (3.6)	338 (50.5)	9 (1.3)	83 (12.4)
Africa	608	594 (97.7)	566 (93.1)	567 (93.3)	566 (93.1)	28 (4.6)	28 (4.6)	200 (32.9)	24 (3.9)	1 (0.2)	0 (0)	31 (5.1)	28 (4.6)
Asia	15	15 (100)	15 (100)	15 (100)	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Pacific	17	14 (82.4)	17 (100)	17 (100)	17 (100)	16 (94.1)	6 (35.3)	7 (41.2)	0 (0)	3 (17.6)	3 (17.6)	1 (5.9)	6 (35.3)

Appendix Supplementary Table 4. Count of refugees immunised according to the UK schedule, by age category and region of health assessment

Characteristic	N in cohort	Refugees immunised according to the UK schedule, n (%)											
		Polio	Measles	Mumps	Rubella	Diphtheria-tetanus	Pertussis	Hepatitis B	Rotavirus	Varicella ¹	Meningococcus ²	Pneumococcus	Hib
Total	6870	764 (11.1)	2338 (34.0)	2217 (32.3)	2217 (32.3)	380 (5.5)	375 (5.5)	668 (9.7)	167 (2.6)	-	-	75 (1.2)	430 (6.3)
Age													
Child (<10)	2195	706 (32.2)	1118 (50.9)	1055 (48.1)	1055 (48.1)	349(15.9)	346 (15.8)	576 (26.2)	167 (7.6)	-	-	75 (3.4)	345 (15.7)
Adolescent (10-19)	1438	56 (3.9)	445 (30.9)	403 (28.2)	403 (28.2)	30(2.1)	29 (2.0)	74 (5.1)	0 (0)	-	-	0 (0)	26 (1.8)
Adult (>19)	3237	2 (0.06)	775 (23.9)	759 (23.4)	759 (23.4)	1(0.03)	0 (0)	18 (5.6)	0 (0)	-	-	0 (0)	0 (0)
Region of Health Assessment													
Eastern Mediterranean	5561	663 (11.9)	1923 (34.6)	1810 (32.5)	1810 (32.5)	309 (5.6)	305 (5.5)	588 (10.6)	148 (2.7)	-	-	45 (0.8)	345 (6.2)
Europe	669	71 (10.6)	353 (52.8)	352 (52.6)	352 (52.6)	55 (8.2)	54 (8.1)	56 (8.4)	1 (0.1)	-	-	4 (0.6)	60 (9.0)
Africa	608	28 (4.6)	59 (9.7)	52 (8.6)	52 (8.6)	14 (2.3)	14 (2.3)	22 (3.6)	18 (3.0)	-	-	26 (4.3)	23 (3.8)
Asia	15	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-	-	0 (0)	0 (0)
Pacific	17	2 (11.8)	3 (17.6)	3 (17.6)	3 (17.6)	2 (11.8)	2 (11.8)	2 (11.8)	0 (0)	-	-	0 (0)	2 (11.8)