

Estimation of global pandemic influenza mortality on the basis of vital registry data from the 1918–20 pandemic: a quantitative analysis

Correspondence to:
Prof Christopher J L Murray,
Harvard Initiative for Global
Health, Harvard University,
104 Mt Auburn Street,
Cambridge, MA, 02138, USA
christopher_murray@harvard.edu

	Mean number of deaths	Median number of deaths (10th–90th percentile range)	2004 population
East Asia	12 926 570	11 348 696 (6 662 538–20 264 212)	1 539 787 000
Brunei	687	547 (241–1375)	366 000
Cambodia	250 645	214 813 (103 507–442 867)	13 798 000
China	10 605 101	8 996 794 (4 399 952–17 859 326)	1 315 409 000
Cook Islands	89	74 (38–159)	18 000
Fiji	3770	3203 (1501–6873)	841 000
Kiribati	1282	1067 (508–2252)	97 000
Laos	77 621	64 840 (30 869–135 108)	5 792 000
Malaysia	73 220	61 994 (28 099–131 831)	24 894 000
Marshall Islands	479	410 (202–838)	60 000
Micronesia	738	631 (293–1292)	110 000
Mongolia	32 136	27 923 (13 450–55 720)	2 614 000
Nauru	30	24 (11–54)	13 000
Niue	13	11 (5–23)	1000
Palau	56	46 (20–103)	20 000
Papua New Guinea	51 056	43 521 (21 108–92 209)	5 772 000
Philippines	625 444	534 256 (257 651–1 089 602)	81 617 000
Samoa	1420	1231 (591–2452)	184 000
Singapore	5074	3980 (1522–10 056)	4 273 000
Solomon Islands	3888	3316 (1608–6713)	466 000
Tonga	658	561 (263–1155)	102 000
Tuvalu	186	162 (77–335)	10 000
Vanuatu	1663	1442 (716–2916)	207 000
Vietnam	1 191 316	1 027 135 (506 579–1 985 188)	83 123 000
Latin America and the Caribbean	2 490 895	2 391 218 (1 882 507–3 255 512)	442 571 000
Antigua and Barbuda	258	213 (97–463)	81 000
Argentina	120 112	96 826 (46 188–210 753)	38 372 000
Bahamas	576	439 (182–1062)	319 000
Barbados	752	606 (280–1344)	269 000
Belize	1665	1401 (703–2815)	264 000
Bolivia	82 383	72 577 (35 575–147 063)	9 009 000
Brazil	807 980	698 028 (319 843–1 461 797)	183 913 000
Chile	51 219	41 762 (18 981–95 250)	16 124 000
Colombia	235 171	199 987 (94 931–433 516)	44 915 000
Costa Rica	21 374	18 759 (8945–36 192)	4 253 000
Cuba	163 960	142 087 (67 903–292 221)	11 245 000
Dominica	457	373 (189–818)	79 000
Dominican Republic	58 795	51 251 (23 922–101 142)	8 768 000
Ecuador	89 350	76 916 (37 199–153 154)	13 040 000
El Salvador	56 254	48 932 (23 363–97 009)	6 762 000
Grenada	620	515 (245–1114)	102 000
Guatemala	97 639	81 512 (39 856–176 084)	12 295 000
Guyana	7880	6826 (3232–13 740)	750 000
Haiti	158 582	137 968 (63 141–280 804)	8 407 000
Honduras	88 327	73 143 (34 747–155 482)	7 048 000
Jamaica	20 082	17 316 (8491–34 510)	2 639 000
Nicaragua	71 253	60 666 (29 228–122 696)	5 376 000
Panama	15 885	13 178 (6148–28 332)	3 175 000

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Paraguay	44751	38858 (18700-77915)	6017000
Peru	174391	147349 (71480-312300)	27562000
Saint Kitts and Nevis	153	127 (60-274)	42000
Saint Lucia	853	715 (355-1546)	159000
Saint Vincent and the Grenadines	938	804 (378-1657)	118000
Suriname	3533	3005 (1481-6220)	446000
Trinidad and Tobago	4816	4091 (1919-8617)	1301000
Uruguay	12078	9897 (4706-22811)	3439000
Venezuela	98807	84031 (38713-173078)	26282000
Middle East	6065429	5835025 (4388107-7940427)	534197000
Afghanistan	692470	580539 (258423-1262820)	28574000
Bahrain	2142	1775 (797-3868)	716000
Cyprus	1920	1547 (706-3541)	826000
Djibouti	11996	9815 (4680-21749)	779000
Egypt	607523	522027 (253014-1103690)	72642000
Iran	425474	364306 (180699-743360)	68803000
Iraq	282727	239788 (113248-499665)	28057000
Israel	13356	11000 (4571-24719)	6601000
Jordan	46115	39582 (18783-82219)	5561000
Kuwait	5745	4630 (1881-10863)	2606000
Lebanon	19046	16134 (7704-33837)	3540000
Libya	26763	22303 (11005-48489)	5740000
Morocco	278720	236933 (117285-490068)	31020000
Oman	9814	8352 (3561-16807)	2534000
Pakistan	1881780	1619212 (762053-3213478)	154794000
Qatar	1710	1396 (595-3375)	777000
Saudi Arabia	87139	72206 (31435-159103)	23950000
Somalia	264596	223031 (105361-470135)	7964000
Sudan	727275	603258 (300911-1236646)	35523000
Syria	119098	104673 (50246-205295)	18582000
Tunisia	61515	51970 (26304-105200)	9995000
United Arab Emirates	8670	6974 (2804-16371)	4284000
Yemen	489836	406620 (197102-884254)	20329000
Eastern Europe and Central Asia	2507311	2435944 (1863056-3255659)	341528000
Albania	38703	32450 (15324-67609)	3112000
Andorra	133	108 (46-246)	67000
Armenia	35767	30916 (14420-62081)	3026000
Azerbaijan	108568	93425 (47233-187668)	8355000
Belarus	55390	47010 (22459-98483)	9811000
Bosnia and Herzegovina	44207	38311 (19007-80395)	3909000
Bulgaria	47095	41085 (20315-83947)	7780000
Croatia	22394	18631 (9138-40253)	4540000
Estonia	6140	5041 (2466-11349)	1335000
Georgia	48460	40580 (20085-84457)	4518000
Kazakhstan	103537	91352 (42402-178913)	14839000
Kyrgyzstan	69410	58686 (29893-122138)	5204000
Latvia	13783	11332 (5451-25075)	2318000
Lithuania	18784	16090 (7995-32658)	3443000
Malta	1092	891 (398-2035)	400000
Monaco	53	42 (18-102)	35000
Moldova	56084	48311 (24096-95819)	4218000
Romania	149855	125932 (61937-261152)	21790000

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Russia	741 691	632 841 (302 700–1 288 132)	143 899 000
San Marino	52	41 (16–97)	28 000
Slovenia	4986	4117 (1860–9426)	1967 000
Tajikistan	108 704	92 530 (44 383–188 651)	6 430 000
Macedonia	20 064	17 797 (8232–34 788)	2 030 000
Turkmenistan	51 842	43 483 (21 661–91 130)	4 766 000
Ukraine	446 144	385 237 (180 534–757 708)	46 989 000
Uzbekistan	227 265	196 343 (97 041–390 356)	26 209 000
Yugoslavia	87 110	74 428 (36 936–150 643)	10 510 000
OECD	2 409 564	2 351 535 (1 805 461–3 072 218)	1 164 821 000
Australia	28 419	21 996 (8760–52 947)	19 942 000
Austria	13 029	10 178 (4048–25 443)	8 171 000
Belgium	14 876	11 573 (5166–28 414)	10 400 000
Canada	54 470	41 686 (17 847–102 804)	31 958 000
Czech Republic	34 112	27 579 (12 793–64 585)	10 229 000
Denmark	7323	5547 (2278–14 318)	5 414 000
Finland	8105	6462 (2401–16 113)	5 235 000
France	89 645	70 215 (29 248–166 402)	60 257 000
Germany	116 396	92 729 (37 534–222 210)	82 645 000
Greece	27 414	22 351 (9857–50 618)	11 098 000
Hungary	37 662	32 048 (14 322–68 377)	10 124 000
Iceland	421	325 (130–840)	292 000
Ireland	6663	5206 (2140–12 844)	4 080 000
Italy	95 174	77 165 (30 278–182 033)	58 033 000
Japan	152 530	120 877 (43 789–308 715)	127 923 000
Luxembourg	521	390 (149–1026)	459 000
Mexico	422 558	352 397 (168 710–770 421)	105 699 000
Netherlands	23 104	18 462 (7163–46 514)	16 226 000
New Zealand	6321	5077 (2173–11 240)	3 989 000
Norway	5776	4424 (1667–11 404)	4 598 000
Poland	155 151	127 797 (57 962–282 379)	38 559 000
Portugal	25 125	20 333 (8528–47 034)	10 441 000
South Korea	101 700	84 456 (38 080–185 354)	47 645 000
Slovakia	20 587	17 706 (7630–36 719)	5 401 000
Spain	87 122	69 683 (30 650–161 734)	42 646 000
Sweden	13 260	10 267 (4132–25 269)	9 008 000
Switzerland	9309	7201 (2783–18 610)	7 240 000
Turkey	375 905	317 754 (143 624–689 077)	72 220 000
UK	93 004	71 781 (28 080–181 421)	59 479 000
USA	383 881	297 883 (114 483–744 226)	295 410 000
South Asia	20 143 199	17 356 790 (11 021 325–32 317 132)	1 632 096 000
Bangladesh	2 107 719	1 786 560 (873 494–3 704 316)	139 215 000
Bhutan	37 082	31 195 (14 989–64 872)	2 116 000
North Korea	336 870	294 237 (135 357–572 897)	22 384 000
India	14 814 546	12 235 206 (5 983 008–26 939 656)	1 087 124 000
Indonesia	1 488 867	1 265 188 (607 771–2 662 276)	220 077 000
Maldives	2455	2066 (1048–4354)	321 000
Burma	398 609	328 426 (156 107–714 579)	50 004 000
Nepal	507 679	425 377 (198 691–921 757)	26 591 000
Sri Lanka	189 188	160 567 (79 506–326 016)	20 570 000
Thailand	260 184	217 241 (99 636–472 597)	63 694 000

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Sub-Saharan Africa	17 865 920	17 243 647 (13 995 484–22 723 677)	721 955 000
Algeria	225 275	194 269 (91 731–409 878)	32 358 000
Angola	301 705	250 615 (123 957–545 334)	15 490 000
Benin	152 646	128 483 (62 734–279 649)	8 177 000
Botswana	10 406	8968 (4374–18 249)	1 769 000
Burkina Faso	359 267	299 943 (138 040–638 481)	12 822 000
Burundi	262 127	214 043 (96 436–480 271)	7 282 000
Cameroon	239 344	204 550 (99 020–423 073)	16 038 000
Cape Verde	6053	5206 (2603–10 757)	495 000
Central African Republic	85 489	71 986 (35 393–151 510)	3 986 000
Chad	283 539	235 444 (109 795–514 205)	9 448 000
Comoros	18 401	15 829 (7530–32 088)	777 000
Republic of Congo	51 392	44 234 (21 190–89 980)	3 883 000
Côte d'Ivoire	250 918	213 119 (103 760–441 162)	17 872 000
Democratic Republic of the Congo	2 213 975	1 789 108 (779 465–4 121 476)	55 853 000
Equatorial Guinea	5273	4548 (2233–9299)	492 000
Eritrea	134 866	114 653 (50 563–247 357)	4 232 000
Ethiopia	3 388 506	2 763 749 (1 259 189–5 953 963)	75 600 000
Gabon	6252	5265 (2499–11 175)	1 362 000
Gambia	30 981	26 318 (12 269–54 053)	1 478 000
Ghana	376 013	318 247 (153 121–682 193)	21 664 000
Guinea	161 467	139 953 (64 244–290 426)	9 202 000
Guinea-Bissau	42 670	36 185 (16 429–75 086)	1 540 000
Kenya	646 683	547 871 (273 514–1 132 973)	33 467 000
Lesotho	25 475	21 611 (10 933–44 665)	1 798 000
Liberia	75 002	61 534 (30 921–134 365)	3 241 000
Madagascar	524 862	439 887 (208 579–950 088)	18 113 000
Malawi	371 886	303 718 (137 605–682 276)	12 608 000
Mali	393 363	331 174 (161 188–695 873)	13 124 000
Mauritania	57 453	47 407 (24 182–102 695)	2 980 000
Mauritius	4756	4025 (1870–8197)	1 233 000
Mozambique	561 068	478 332 (224 457–1 024 848)	19 424 000
Namibia	13 796	11 573 (5922–24 576)	2 009 000
Niger	418 160	354 098 (162 046–775 762)	13 499 000
Nigeria	2 851 059	2 345 389 (1 135 347–5 038 748)	128 709 000
Rwanda	272 490	227 497 (104 528–513 231)	8 882 000
Sao Tome and Principe	3460	2962 (1397–6171)	153 000
Senegal	180 955	155 395 (74 168–312 049)	11 386 000
Seychelles	318	268 (119–572)	80 000
Sierra Leone	199 682	161 144 (71 380–363 388)	5 336 000
South Africa	248 381	217 291 (102 344–430 594)	47 208 000
Swaziland	8271	7168 (3409–14 325)	1 034 000
Togo	118 952	103 554 (49 935–203 935)	5 988 000
Uganda	644 465	543 562 (265 678–1 167 716)	27 821 000
Tanzania	1 214 409	1 005 766 (464 256–2 154 038)	37 627 000
Zambia	262 807	222 741 (104 215–469 365)	11 479 000
Zimbabwe	161 600	140 158 (69 745–274 113)	12 936 000
Total	64 408 888	62 118 132 (51 254 648–80 549 636)	6 376 955 000

OECD=Organisation for Economic Co-operation and Development.

Webtable: Estimated number of deaths caused by the emergence of a pandemic influenza strain in 2004