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## Countdown to 2015: assessment of donor assistance to maternal, newborn, and child health between 2003 and 2006

Giulia Greco, Timothy Powell-Jackson, Josephine Borghi, Anne Mills

### Summary

**Background** To track donor assistance to maternal, newborn, and child health-related activities is necessary to assess progress towards Millennium Development Goals 4 and 5 and to foster donor accountability. Our aim was to analyse aid flows to maternal, newborn, and child health for 2005 and 2006 and trends between 2003 and 2006.

**Methods** We analysed and coded the complete aid activities database for 2005 and 2006 with methods that we developed previously to track official development assistance. For the 68 Countdown priority countries, we report two indicators for use in monitoring donor disbursements: official development assistance to child health per child and official development assistance to maternal and neonatal health per livebirth.

**Findings** Donor disbursements increased from US\$2119 million in 2003 to \$3482 million in 2006; funding for child health increased by 63% and that for maternal and newborn health increased by 66%. In the 68 priority countries, child-related disbursements increased from a mean of \$4 per child in 2003 to \$7 per child in 2006; disbursements for maternal and neonatal health increased from \$7 per livebirth in 2003 to \$12 per livebirth in 2006. Nonetheless, disbursements fell in some countries. After adjustment for other determinants, countries with higher under-5 mortality received more official development assistance per child, but official development assistance to maternal and newborn health did not seem to be well targeted towards countries with the greatest maternal health needs.

**Interpretation** Donor resource tracking should be continued to help hold donors accountable and encourage targeting of resources to countries with greatest needs.

**Funding** Partnership for Maternal, Newborn and Child Health.

### Introduction

Although there exists a lack of clarity on what constitutes an adequate target of aid disbursement to improve maternal, newborn, and child health to acceptable levels, evidence broadly points towards a substantial funding gap between what is needed to meet Millennium Development Goal (MDG) targets and what is currently invested in developing countries.<sup>1-3</sup> To ensure that sufficient resources become available, donors will need to play their part in providing additional funding to support national governments in meeting agreed targets. Monitoring of aid disbursements to maternal, newborn, and child health to those countries with the greatest need is an important part of the process to assess progress and promote donor accountability.

We have previously developed and tested a method of tracking official development assistance in support of maternal, newborn, and child health-related interventions and services to recipient countries.<sup>4</sup> Our findings suggested that levels of official development assistance were broadly inadequate to make a substantial contribution towards filling the funding gap. This work also provided some indication that donor spending could be better targeted to countries with the greatest health needs, since the data showed substantial

variation in per beneficiary donor assistance between priority countries.

Here, we update estimates of official development assistance to maternal, newborn, and child health to include the years 2005 and 2006, which allows us to undertake a more extensive analysis of trends over time. Specifically, we examine whether there has been a sustained increase in official development assistance to maternal, newborn, and child health and hence whether donors are living up to their promises to support countries to achieve MDG targets. Additionally, the determinants of aid allocations to developing countries are explored to elucidate the direction and intensity of financial flows to maternal, newborn, and child health. This study is part of the Countdown initiative, a collaborative effort that aims to support countries in meeting their commitments to global goals through monitoring mechanisms and effective use of information collected.

### Methods

We analysed and coded the complete aid activities database for the years 2005 and 2006 with methods described previously.<sup>4</sup> We included all 22 donor countries and the European Union represented in the Development

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Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine, London, UK

(G Greco MSc,

T Powell-Jackson MSc, J Borghi PhD, Prof A Mills PhD)

Correspondence to:

Prof Anne Mills, Health Economics and Financing Programme, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK  
anne.mills@lshtm.ac.uk

For the Countdown initiative see <http://www.countdown2015.mnch.org>

	Indicator	Year	Source
Health need	Under-5 mortality	2005	SOWC 2007
Health need	DALYs lost to maternal and perinatal conditions	2002	WHO
Economic need	GNI per head	2005	World Bank
Scale	Population	2005	UN Population Prospect
Aid effectiveness	Corruption index (0–10, 0 highest)	2005	Transparency International*
Freedom	Political rights index (1–7, 1 highest)	2005	Freedom House†
Freedom	Civil liberties index (1–7, 1 highest)	2005	Freedom House†
Government commitment to health	Government expenditure on health as percentage of total government expenditure	2005	WHO

DALY=disability adjusted life-year. GNI=gross national income. SOWC=State of the World's Children report. \*www.transparency.org. †www.freedomhouse.org.

**Table 1: Determinants of aid, year of data, and source of data**

Assistance Committee of the Organisation for Economic Co-operation and Development (OECD). Additionally, we included the World Bank, UNICEF, the GAVI Alliance, and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) as multilateral development organisations or global health initiatives. The UN Population Fund (UNFPA) would have been included but did not report to the Development Assistance Committee in either 2005 or 2006.

For all but one of the donors, we used data from the creditor reporting system database, maintained and administered by the OECD. The GAVI Alliance provided disbursement data on request. Global Fund disbursements were included in the database and checked for consistency with data available from the Global Fund website. The World Bank reports disbursement data for projects related to HIV/AIDS prevention and care only. Commitment data were used for all other World Bank projects as a next-best alternative. We could not estimate how the commitments were allocated over each year of the project lifetime. For consistency with previous analyses, we included the whole amount committed, acknowledging the fact that the results might not represent actual disbursement.

We present the results in aggregate terms by donor, and by the 68 recipient countries identified by the Countdown group as a priority in terms of child mortality and maternal mortality. The original list of priority recipients was expanded to include eight more countries with a high number of maternal deaths or maternal mortality ratio. To analyse trends across years, we converted estimates of official development assistance into constant 2005 US dollars. For each of the priority countries, we report on two indicators for use in monitoring donor disbursements: official development assistance to child health per child and official

	2003	2004	2005	2006
Total	2 119 382	2 056 875	2 935 428	3 481 703
Child health	1 414 952 (67%)	1 508 676 (73%)	2 034 680 (69%)	2 308 896 (66%)
Maternal and neonatal health	704 430 (33%)	548 199 (27%)	900 748 (31%)	1 172 807 (34%)
Source of aid flow				
Bilateral	1 296 375 (61%)	1 248 270 (61%)	1 811 920 (62%)	1 880 277 (54%)
Multilateral	650 515 (31%)	484 126 (24%)	615 244 (21%)	1 096 010 (31%)
Global health initiatives	172 492 (8%)	324 479 (16%)	508 265 (17%)	505 417 (15%)

Disbursements are in constant 2005 US\$ (thousands). Percentages represent the proportion of total official development assistance to maternal, newborn, and child health for those particular line items.

**Table 2: Worldwide official development assistance to maternal, newborn, and child health by source of aid flow, 2003–06**

	2003	2004	2005	2006
General budget support	51 044 (2%)	86 216 (4%)	50 358 (2%)	68 650 (2%)
Health sector support*	31 036 (1%)	44 079 (2%)	66 722 (2%)	123 060 (3%)
Projects	2 037 302 (96%)	1 926 579 (94%)	2 818 348 (96%)	3 289 993 (95%)
Type of project				
General health care	710 543 (35%)	809 464 (42%)	936 225 (33%)	952 223 (29%)
Disease specific	134 082 (7%)	274 660 (14%)	447 492 (16%)	658 209 (20%)
MNCH specific	1 192 678 (59%)	842 456 (44%)	1 434 631 (51%)	1 679 562 (51%)
MNCH-specific projects				
IMCI	16 460 (1%)	18 302 (2%)	14 383 (1%)	6842 (0%)
PMTCT	3841 (0%)	3195 (0%)	18 080 (1%)	32 104 (2%)
Nutrition	113 364 (10%)	80 857 (10%)	114 105 (8%)	223 010 (13%)
Immunisation	552 084 (46%)	460 577 (55%)	519 977 (36%)	477 205 (28%)
Child health	41 048 (3%)	44 308 (5%)	180 686 (13%)	127 617 (8%)
Maternal health/safe motherhood	417 205 (35%)	207 602 (25%)	361 068 (25%)	346 159 (21%)
Non-specified MNCH	48 675 (4%)	27 614 (3%)	226 331 (16%)	466 625 (28%)

MNCH=maternal, newborn, and child health. IMCI=Integrated Management of Childhood Illness. PMTCT=prevention of mother-to-child transmission of HIV infection. Disbursements are in constant 2005 US\$ (thousands). Percentage values represent the proportion of the total official development assistance to MNCH for those particular line items. \*Includes basket funding.

**Table 3: Worldwide official development assistance to maternal, newborn, and child health by type of aid and purpose of projects between 2003 and 2006**

development assistance to maternal and neonatal health per livebirth. In reporting these indicators, we corrected for missing data over the 4 years by dropping those donors that did not report so as to ensure that trends were comparable and were not affected by changes in reporting status.

Estimates of the number of children under age 5 years (under-5) and the crude birth rate were taken from the World Population Prospect 2006. The framework of analysis allowed comparisons of disbursements for child health and maternal and neonatal health by types of donor (bilateral, multilateral, and global health initiatives).

We also examined the main determinants of official development assistance to maternal, newborn, and child health on the basis of characteristics of the 68 priority recipient countries. Specifically, we used a selection of

For the **OECD database** see <http://www.oecd.org/dac/stats/idsonline>

For the **Global Fund website** see <http://www.theglobalfund.org/en>

For the **World Population Prospect 2006** see <http://esa.un.org/unpp>

	2003			2004			2005			2006		
	Child health	Maternal and newborn health	Total	Child health	Maternal and newborn health	Total	Child health	Maternal and newborn health	Total	Child health	Maternal and newborn health	Total
Australia	20 411	13 203	33 614	18 453	17 151	35 604	3202	979	4181	52 416	24 161	76 576
Austria	2111	1043	3154	2831	1088	3919	2582	1761	4343	4176	1729	5905
Belgium	8617	2994	11 611	NA	NA	NA	16 789	10 324	27 113	21 283	11 607	32 889
Canada	39 651	10 884	50 536	48 080	19 755	67 836	66 637	42 644	109 281	72 376	31 937	104 313
Denmark	NA	NA	NA	18 825	6914	25 739	22 823	8234	31 057	18 980	7793	26 773
European Union	28 938	26 534	55 472	43 364	19 054	62 418	82 443	58 119	140 562	155 519	132 686	288 205
Finland	4125	3590	7715	NA	NA	NA	NA	NA	NA	6079	8022	14 100
France	27 288	16 366	43 654	38 020	22 986	61 006	28 095	12 255	40 350	5630	3068	8698
GAVI Alliance	121 260	0	121 260	189 355	0	189 355	206 123	0	206 123	178 454	0	178 454
Germany	33 767	31 825	65 592	28 940	9042	37 982	31 489	30 622	62 111	51 663	33 172	84 835
Global Fund	43 351	7881	51 231	113 903	21 220	135 124	252 497	49 645	302 142	264 475	62 488	326 963
Greece	12 212	1711	13 923	1239	1131	2370	8911	3308	12 219	3343	3103	6445
Ireland	13 852	4554	18 406	22 353	7723	30 076	19 673	5903	25 576	20 647	7969	28 615
Italy	15 668	5153	20 822	15 957	6306	22 263	1719	1026	2745	NA	NA	NA
Japan	72 515	47 559	120 074	65 138	28 136	93 274	60 601	24 627	85 227	113 833	35 161	148 994
Luxembourg	NA	NA	NA	8782	2986	11 769	5681	5939	11 620	7823	6960	14 783
Netherlands	35 972	37 060	73 032	31 212	32 331	63 543	38 663	37 667	76 330	37 735	48 049	85 784
New Zealand	2394	639	3033	3399	2973	6372	3671	2768	6439	3662	3285	6947
Norway	17 960	13 571	31 530	20 514	9411	29 925	22 266	14 869	37 134	32 707	15 060	47 767
Portugal	902	1032	1934	1217	1316	2533	1608	1513	3121	1647	862	2509
Spain	20 910	14 443	35 354	23 219	14 732	37 951	26 780	23 021	49 801	34 868	25 434	60 303
Sweden	17 010	16 805	33 815	22 493	22 433	44 926	20 194	44 242	64 436	43 137	41 171	84 308
Switzerland	12 484	3178	15 662	13 279	4563	17 842	6845	5117	11 963	13 206	8775	21 981
UNAIDS	NA	NA	NA	NA	NA	NA	1512	0	1512	NA	NA	NA
UNFPA	564	187 318	187 882	65	62 090	62 155	NA	NA	NA	NA	NA	NA
UNICEF	62 301	16 204	78 505	61 872	15 881	77 753	80 184	16 409	96 593	61 104	21 210	82 314
UK	150 670	59 226	209 896	118 686	63 911	182 597	230 183	90 585	320 768	210 742	114 474	325 216
USA	397 271	105 748	503 019	404 415	66 331	470 746	515 914	310 190	826 104	448 861	243 674	692 535
World Bank	252 746	75 910	328 656	193 064	88 736	281 800	277 593	98 984	376 577	444 530	280 960	725 490
Grand total	1 414 952	704 430	2 119 382	1 508 676	548 199	2 056 875	2 034 680	900 748	2 935 428	2 308 896	1 172 807	3 481 703

Total disbursements are in constant 2005 US\$ (thousands). NA=data not reported to creditor reporting system or, for UNAIDS, not possible to allocate to recipient countries. World Bank data are commitments.

**Table 4: Worldwide official development assistance to maternal, newborn, and child health by donor between 2003 and 2006**

predictor variables that were grouped under the following dimensions: health need, economic need, scale, aid effectiveness, freedom, and government commitment to health (table 1). Health need was defined as under-5 mortality in the case of child health and as disability adjusted life-years lost for maternal and perinatal conditions for maternal and newborn health. The indicators of aid effectiveness and freedom are commonly used in analyses of official development assistance.<sup>5,6</sup> Two ordinary least squares (OLS) regression models were estimated, with log of official development assistance to child health per child and official development assistance to maternal and newborn health per livebirth as the dependent variables. Average official development assistance per person for 2003–06 was used to account for the volatility of disbursements. We

did standard regression diagnostics and checks to verify regression assumptions and to ensure that the models were specified correctly.

#### Role of the funding source

The study sponsor had no role in the study design, data analysis, data interpretation, or writing of the paper. All authors had full access to all the data in the study, and the corresponding author had final responsibility for the decision to submit for publication.

#### Results

The volume of aid to maternal, newborn, and child health-related activities amounted to US\$2935 million in 2005 and \$3482 million in 2006 (table 2), representing just 3% of gross development assistance disbursements.<sup>7</sup>

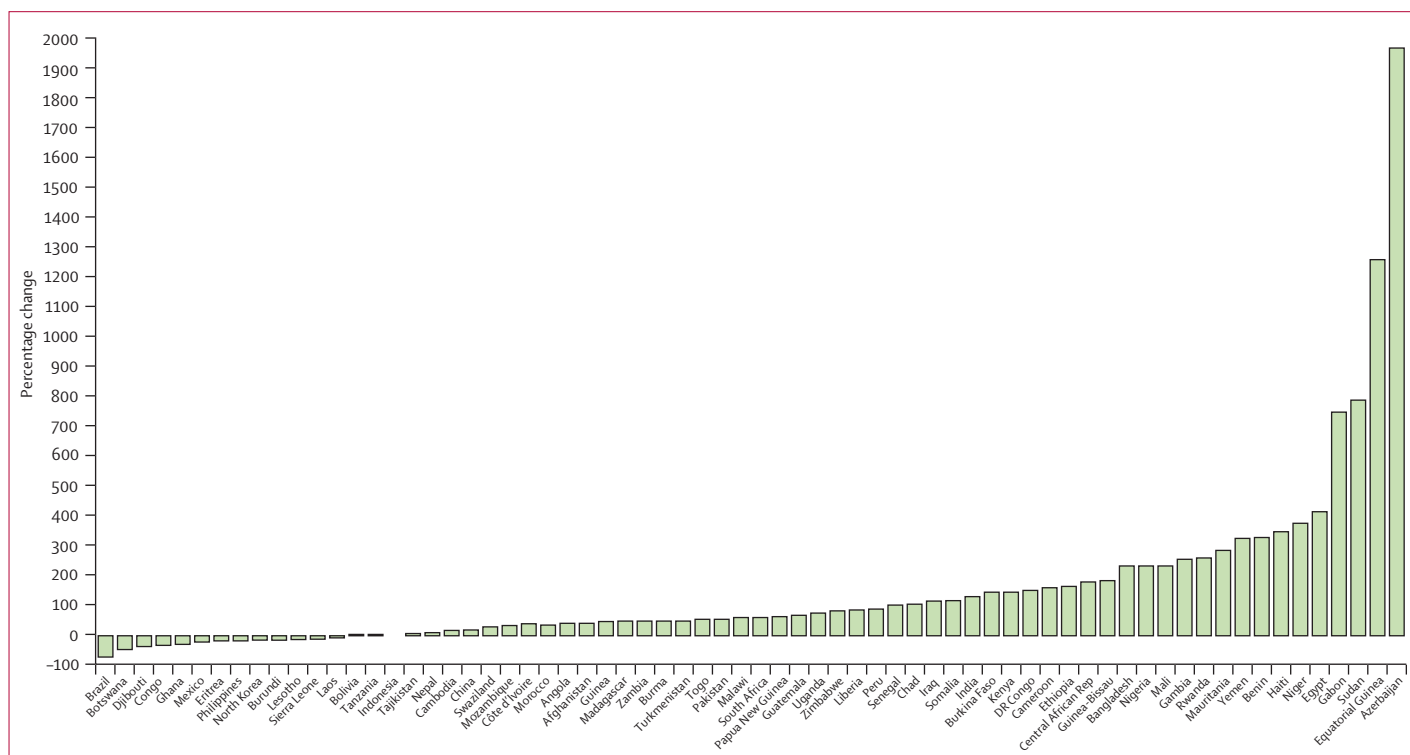


Figure: Percentage change in total official development assistance to maternal, newborn, and child health between 2003 and 2006 by recipient country

As in previous years, child health expenditure accounted for more than two-thirds of all official development assistance for these activities. Bilateral donors accounted for almost two-thirds of total aid to maternal, newborn, and child health (table 2). Together, the GAVI Alliance and the Global Fund disbursed more than \$505 million per year.

The volume of official development assistance to maternal, newborn, and child health rose by 64% between 2003 and 2006 (table 2); there were increases of 63% in official development assistance to child health and of 66% to maternal and newborn health. Bilateral donors increased their contributions by 45%, whereas contributions from multilateral donors rose by 68%. Aid disbursement from the global health initiatives increased by almost 200% from 2003 to 2006.

As in previous years, the means of disbursement preferred by donors was through projects, which probably explains the variation seen in disbursement flows (table 3). General budget support and health sector support together shared between 3% and 6% of disbursed funds. The amount of aid designated for projects that target mothers and children exclusively increased by 41% to almost \$1700 million in 2006, with immunisation being the major specific activity to target these groups. Projects oriented exclusively to nutrition amounted to \$114 million in 2005 and \$223 million in 2006, accounting for 8% and 13% of spending specific to maternal, newborn, and child health, respectively.

The three biggest donors of 2005 (the USA, World Bank, and the UK) disbursed \$1523 million; the following year the three biggest donors were the USA, the World Bank, and the Global Fund, who collectively contributed \$1745 million (table 4). In both years the amount accounted for more than half of total aid to maternal, newborn, and child health. Most donors increased their contribution between 2003 and 2006 (table 4). In 2006, eight donors disbursed more than double their contribution in 2003, and two of them (the European Union and the Global Fund) disbursed more than four times the 2003 amount. Only two donors—France and Greece—showed a decrease in maternal, newborn, and child health disbursements in 2006. Italy did not report data for this year, but disbursements had been reduced from \$21 million in 2003 to less than \$3 million in 2005.

Most developing countries received more total aid to maternal, newborn, and child health in 2006 than in 2003 (figure). In some countries—eg, Niger, Haiti, and Benin—there was a trebling in official development assistance received. Equatorial Guinea and Azerbaijan were exceptional cases, where the amount of official development assistance increased by more than twelve times. Of the 68 priority recipients, 16 (including Brazil, Congo, Ghana, and Burundi) saw total official development assistance to maternal, newborn, and child health fall by an average of 22%.

Table 5 presents estimates of total official development assistance and two indicators (aid disbursements to child

	Countdown 2005			Countdown 2006			Percentage change between 2003 and 2006	
	Total	To child health per child	To maternal and newborn health per livebirth	Total	To child health per child	To maternal and newborn health per livebirth	To child health per child	To maternal and newborn health per livebirth
Afghanistan	60 071	8.6	8.7	69 324	10.3	7.7	56%	-19%
Angola	47 474	12.0	16.1	19 873	5.4	4.8	52%	-14%
Azerbaijan	3063	4.3	3.4	9435	10.0	24.2	1511%	3188%
Bangladesh	204 654	8.4	16.5	113 303	3.3	15.1	241%	233%
Benin	12 152	7.8	3.6	35 724	19.6	20.5	279%	521%
Bolivia	10 241	6.2	11.1	14 298	7.9	17.9	-2%	-15%
Botswana	28	0.0	0.4	477	2.0	0.6	121%	-96%
Brazil	2348	0.1	0.2	2310	0.1	0.2	-74%	-65%
Burkina Faso	25 276	8.6	6.6	24 573	7.7	8.5	150%	97%
Burma	15 833	3.0	1.9	13 857	2.5	2.4	74%	-17%
Burundi	15 425	10.1	5.7	14 674	9.6	4.8	109%	-86%
Cambodia	20 355	6.9	22.4	13 132	3.9	16.2	-21%	178%
Cameroon	19 257	6.8	4.4	15 429	5.1	4.8	164%	94%
Central African Republic	5326	7.0	5.7	4524	5.7	5.5	154%	291%
Chad	11 524	4.9	5.4	5945	2.1	4.3	69%	204%
China	33 818	0.3	0.4	41 697	0.3	0.8	2%	50%
Congo	2421	2.7	3.0	1182	1.3	1.2	-35%	-15%
Côte d'Ivoire	8806	2.8	1.7	7307	2.4	1.0	33%	8%
Democratic Republic of the Congo	78 656	4.5	9.7	51 228	3.6	3.3	119%	260%
Djibouti	3494	24.9	22.3	1811	12.8	11.2	-30%	-58%
Egypt	17 163	1.3	3.3	25 449	2.0	4.0	296%	1219%
Equatorial Guinea	1504	14.3	12.7	4117	37.8	37.8	2608%	333%
Eritrea	7156	8.9	2.2	5847	5.1	10.4	-29%	-5%
Ethiopia	79 952	3.9	10.0	164 626	9.3	13.9	141%	222%
Gabon	4010	17.0	20.6	3469	13.6	22.2	717%	874%
Gambia	5484	21.2	11.1	3349	10.7	14.9	176%	1070%
Ghana	42 068	11.0	12.2	48 255	11.8	16.6	-26%	-37%
Guatemala	13 024	3.4	14.5	20 489	5.7	20.8	59%	72%
Guinea	21 877	9.2	19.1	8045	4.2	3.2	39%	35%
Guinea-Bissau	2876	6.3	11.9	1817	4.2	6.1	241%	76%
Haiti	12 949	6.7	23.0	18 555	11.1	24.0	241%	1017%
India	214 566	1.1	3.2	528 089	2.7	7.9	45%	1077%
Indonesia	36 347	1.1	2.8	73 034	2.0	6.8	-4%	7%
Iraq	94 518	16.7	26.9	80 029	10.5	36.7	40%	535%
Kenya	65 360	8.4	13.5	96 402	12.9	15.9	125%	170%
Laos	12 523	9.2	27.9	5959	4.7	10.4	-20%	19%
Lesotho	3395	10.2	19.7	1505	5.1	5.8	-8%	-36%
Liberia	6264	7.9	7.8	11 828	15.3	12.3	65%	175%
Madagascar	29 883	7.5	10.7	27 459	5.7	14.7	43%	40%
Malawi	37 000	12.0	17.9	51 094	14.5	32.6	48%	75%
Mali	24 898	6.4	13.0	29 009	7.6	13.4	188%	346%
Mauritania	2417	3.2	7.6	6658	7.3	27.4	184%	704%
Mexico	2338	0.1	0.5	2342	0.1	0.4	-15%	-33%
Morocco	8612	1.5	5.6	16 141	2.7	10.8	573%	-36%
Mozambique	46 586	9.7	19.7	49 666	10.8	17.3	19%	50%
Nepal	13 438	3.0	3.5	16 690	2.1	12.6	-36%	106%
Niger	16 927	5.0	4.7	33 459	9.1	10.4	271%	2647%

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	Countdown 2005			Countdown 2006			Percentage change between 2003 and 2006	
	Total	To child health per child	To maternal and newborn health per livebirth	Total	To child health per child	To maternal and newborn health per livebirth	To child health per child	To maternal and newborn health per livebirth
(Continued from previous page)								
Nigeria	121 482	4.8	3.0	196 470	6.9	7.5	166%	1626%
North Korea	3518	1.9	0.9	2473	1.3	0.8	-12%	20%
Pakistan	93 860	2.2	10.7	90 804	3.5	3.4	36%	165%
Papua New Guinea	3778	3.3	6.4	16 965	12.2	39.0	21%	174%
Peru	20 567	4.6	12.5	13 219	2.8	7.8	71%	109%
Philippines	7254	0.4	1.6	11 495	0.8	1.4	-24%	-11%
Rwanda	22 642	12.5	12.8	42 160	20.7	27.1	188%	599%
Senegal	24 482	9.8	16.3	33 121	11.4	28.1	64%	208%
Sierra Leone	6696	5.5	5.7	11 099	9.3	8.1	2%	-46%
Somalia	8252	4.5	4.4	11 711	5.8	8.0	97%	155%
South Africa	23 796	3.5	5.9	20 927	3.1	4.4	71%	17%
Sudan	67 629	9.2	15.4	81 519	11.1	17.6	617%	1620%
Swaziland	2069	14.9	1.4	1690	10.4	7.8	11%	124%
Tajikistan	9870	9.6	9.9	6212	6.0	5.9	-8%	52%
Tanzania	108 065	14.7	13.7	66 601	8.0	12.3	-1%	-16%
Togo	6763	5.6	4.6	3828	3.1	2.9	47%	53%
Turkmenistan	1148	2.1	1.0	1029	1.8	1.2	62%	-16%
Uganda	67 999	9.8	7.8	71 147	9.4	11.4	62%	85%
Yemen	35 942	6.0	17.5	20 686	3.0	11.7	248%	440%
Zambia	83 357	30.0	52.0	58 798	23.5	24.3	41%	42%
Zimbabwe	9265	7.2	18.5	22 098	6.6	28.1	16%	319%

Data for total disbursements are in constant 2005 US\$ (thousands). Per child and per livebirth data are in constant 2005 US\$.

**Table 5: Aggregate official development assistance to maternal, newborn, and child health, to child health per child, and to maternal and newborn health per livebirth in 2005 and 2006, and percentage change for the two categories between 2003 and 2006**

health per child and to maternal health per livebirth) by recipient country for the years 2005 and 2006, as well as the percentage change between 2003 and 2006. Of the 68 Countdown priority countries, 52 countries saw increases in official development assistance to child health per child between 2003 and 2006, on average by 200% per country. 50 countries also saw official development assistance to maternal and newborn health

per livebirth rise, on average by more than 400%. Some countries, including Angola, Burundi, Morocco, and Burma received more assistance for activities that targeted children, but less for maternal and newborn health. Nepal, Cambodia, Tajikistan, and Laos saw a reduction in official development assistance to child health but an increase in that for maternal and newborn health-related activities. Three countries (Brazil, Mexico, and Tajikistan) identified by Countdown as priorities only for child health have seen a reduction in child-health assistance. Lesotho, Bolivia, and Eritrea, priorities in terms of maternal mortality only, have seen a decrease in aid for maternal health-related activities. Across the 68 priority countries, disbursement for activities that target children increased from a mean of \$4 per child in 2003 to just over \$7 per child in 2006, and aid for activities oriented to improve maternal and neonatal health increased from a mean of \$7 per livebirth in 2003 to \$12 per livebirth in 2006. However, some countries—eg, the Philippines, Congo, and North Korea—still receive as little as \$1 per child, or much less.

In the child health regression model (table 6), the coefficients on child mortality, income per head, and population were significant (all  $p < 0.05$ ). The coefficient

	Coefficient	t stat	p> t
ln (under-5 mortality)	0.50	2.550	0.014
ln (income per head)	-0.24	-2.260	0.028
ln (population)	-0.31	-4.360	0.000
Corruption	-0.10	-1.300	0.198
Civil liberty	-0.23	-1.470	0.148
ln (health commitment)	-0.01	-0.080	0.936
Constant	6.86	2.920	0.005
R <sup>2</sup>	0.6188		
Adjusted R <sup>2</sup>	0.5757		
Observations	60		

**Table 6: OLS estimation of log (official development assistance) to child health per child between 2003 and 2006**

	Coefficient	t stat	P> t
ln (DALYs lost)	0.36	1.550	0.127
ln (income per head)	-0.11	-0.890	0.378
ln (population)	-0.28	-4.000	0.000
Corruption	-0.10	-1.180	0.243
Civil liberty	-0.03	-0.160	0.877
ln (health commitment)	0.05	0.310	0.758
Constant	6.75	2.890	0.006
R <sup>2</sup>	0.4159		
Adjusted R <sup>2</sup>	0.3498		
Observations	60		

DALY=disability adjusted life-year.

**Table 7: OLS estimation of log (official development assistance) to maternal and newborn health per livebirth between 2003 and 2006**

for health need was positive, indicating that countries with higher under-5 mortality received more official development assistance per child, with each percentage increase in mortality resulting in a 0.5% increase in official development assistance to child health per child. The coefficient on income was negative, suggesting that wealthier countries received less aid per child. Aid to child health also decreased with population size such that, for each percentage increase in population size, there was a 0.31% reduction in official development assistance to child health. Government commitment to health, corruption, and indicators of freedom (both political and civil) did not seem to be important determinants of official development assistance to child health.

Although the direction of coefficients on the explanatory variables in the maternal and newborn health model were as expected (table 7), only population size was significant—ie, countries with larger populations received less official development assistance. Of particular concern is the fact that official development assistance to maternal and newborn health was not associated with the degree of need, as represented in the model by disability adjusted life-years lost.

## Discussion

The volume of official development assistance to maternal, newborn, and child health rose from \$2119 million in 2003 to \$3482 million in 2006, with increases of 63% for child health and 66% for maternal and newborn health. There was improved targeting to the 68 priority countries, with an almost doubling of disbursement per beneficiary. Both multilateral agencies and bilateral donors increased their contribution between 2003 and 2006 on average by 57%, whereas disbursements from global health initiatives for maternal and child health rose by almost 200%. However, despite a general increase in aid to maternal, newborn, and child health, some priority countries have seen a reduction in development assistance. Despite the re-affirmation of donor commitment in the Paris Declaration on Aid

Effectiveness to sustain partner countries in their domestic developmental strategies, general budget support and health sector support still maintain collectively a share of only 5%, and the bulk of assistance is delivered through projects.

Our data indicate that disbursements of assistance are highly volatile and variable between years, as has been shown previously.<sup>8</sup> This volatility makes effective planning and provision of appropriate levels of funding for various strategic priorities difficult for developing countries, especially those that are highly dependent on aid. Donors to maternal, newborn, and child health need not only to provide long-term commitments but also to coordinate themselves collectively such that funding at the country level does not fluctuate excessively year on year. Some of the variation seen here is driven by large-scale programmes such as the malaria booster project of the World Bank, the poliomyelitis eradication campaign, and those of the global health initiatives. Changes in maternal, newborn, and child health aid flows towards conflict countries such as Afghanistan, Iraq, and Sudan is explained largely by projects that target emergency health care, whereas changes in indicators in India are mainly driven by one very large World Bank project on child and reproductive health in 2006.

Few donors have made public the factors that affect the intensity and direction of their official development assistance. Many studies have sought to understand the determinants of development aid flows. Most studies describe and interpret aid allocation between recipient countries against certain normative criteria, including human rights, aid effectiveness, economic growth, and corruption, to investigate donor preferences.<sup>5,9-12</sup> Some studies describe how much each recipient country should receive according to its need.<sup>13-15</sup> However, no studies have explored determinants of sub-sector aid allocations, such as maternal and child health.

Several studies<sup>5,16</sup> have found considerable evidence that the trend of aid flows is affected by factors that diverge from the actual needs of recipients, such as strategic and political reasons, colonial ties, trade openness, conflict, and democracy. In particular, Alesina and Dollar<sup>5</sup> have shown that bilateral aid allocations are shaped by political and strategic preferences, since donors favour those countries who share the same political position. As shown here, aid flows to maternal, newborn, and child health are not only driven by bilateral donors, but also by multilateral agencies and global health initiatives, which have an increasingly important role. This change is likely to be a positive development in terms of linking allocations more closely to health needs. Our data suggest that, while controlling for other factors, countries with the greatest child health needs do receive more assistance for improving the health of children. However, this does not seem to be the case for maternal and newborn health. We tested other indicators to proxy maternal and newborn health need, including the

maternal mortality ratio and rate of neonatal mortality, but these were also non-significant. That the governance and freedom indicators were not significant is perhaps not surprising, since most of the funds flow through projects and therefore bypass government systems. There are thus few reasons to expect levels of official development assistance to be sensitive to governance and political or civil freedom.

There is no evidence that less corrupt governments receive more aid than others.<sup>6,17</sup> Our findings show that the measures of corruption and government commitment to health were not significant for child or maternal health—ie, countries that are less corrupt or show a greater commitment to health are not necessarily rewarded with more aid.

Although the reliability of the methods used here has been tested,<sup>4</sup> there are inevitably limitations that result from missing data. The data presented here were produced by analysis of the creditor reporting system database maintained by the OECD. Yearly data are reported by donors with varying degrees of delay, are released after a period of time by the OECD, and are updated intermittently—the data for 2006 were sufficiently complete to be analysed only in mid-February, 2008. Nonetheless, the completeness of reporting by donors has improved over time, as evident in the decreasing number of donors for whom data are unavailable. Indeed, missing data were mainly for small donor countries, and are thus unlikely to affect the broad conclusions drawn. A further limitation is that we allocated funds to maternal, newborn, and child health by analysis of project descriptions provided by donors. These descriptions can be vague, poorly translated by the donor, or in languages that had to be translated with online translation services. Additionally, allocation to purpose codes in the database (eg, basic health care, training, infrastructure) could have been inconsistent with the project descriptions. Further, data could also have been missing because they can only be included when the recipient country can be identified; regional or multicountry projects might have been excluded. Lastly, World Bank data represent commitments rather than disbursements. However, the expression of these data is consistent across all years and does not affect the trend, although analyses are more vulnerable to the effect of variable allocations, as shown by the World Bank India project.

This study demonstrates the value of year on year analysis of donor assistance to maternal, newborn, and child health. These analyses, for example, show that although expenditure is increasing, it is still far from sufficient; additional investments are needed. Despite

the Paris declaration, the great bulk of disbursements are still through projects rather than sector or budget support. Analyses, such as those presented here, must continue to be done so that donor commitments can be monitored and assessed to make sure that the most needy countries are benefiting.

#### Contributors

All authors participated in the study design, analysis and interpretation of the data, and writing of the manuscript. All authors saw and approved the final version of the manuscript.

#### Conflict of interest statement

We declare that we have no conflict of interest.

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