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Tracking official development assistance for reproductive health in conflict-affected countries: 2002–2011

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Objective To provide information on trends on official development assistance (ODA) disbursement patterns for reproductive health activities in 18 conflict-affected countries.

Design Secondary data analysis.

Sample 18 conflict-affected countries and 36 non-conflict-affected countries.

Methods The Creditor Reporting System (CRS) database was analyzed for ODA disbursement for direct and indirect reproductive health activities to 18 conflict-affected countries (2002–2011). A comparative analysis was also made with 36 non-conflict-affected countries in the same 'least-developed' income category. Multivariate regression analyses examined associations between conflict status and reproductive health ODA and between reproductive needs and ODA disbursements.

Main outcome measures Patterns of ODA disbursements (constant U.S. dollars) for reproductive health activities.

Results The average annual ODA disbursed for reproductive health to 18 conflict-affected countries from 2002 to 2011 was

US\$ 1.93 per person per year. There was an increase of 298% in ODA for reproductive health activities to the conflict-affected countries between 2002 and 2011; 56% of this increase was due to increases in HIV/AIDS funding. The average annual per capita reproductive health ODA disbursed to least-developed non-conflict-affected countries was 57% higher than to least-developed conflict-affected countries. Regression analyses confirmed disparities in ODA to and between conflict-affected countries.

Conclusions Despite increases in ODA for reproductive health for conflict-affected countries (albeit largely for HIV/AIDS activities), considerable disparities remains.

Keywords Aid, conflict, ODA, reproductive health, war.

Tweetable abstract Study tracking 10 years of aid for reproductive aid shows major disparities for conflict-affected countries.

Linked article This article is commented on by Nynke van den Broek, p. 1705 in this issue. To view this mini commentary visit <http://dx.doi.org/10.1111/1471-0528.13908>.

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Introduction

Reproductive health problems remain a leading cause of mortality and morbidity for women and girls of childbearing age worldwide.¹ Impoverished women, especially those living in low- and middle-income countries, suffer disproportionately from unintended pregnancies, maternal death and disability, sexually transmitted infections (STIs) including HIV, and other problems related to their reproductive system and sexual behaviour.¹

There is strong evidence of increased mortality and morbidity caused by poor access to reproductive health care in

all resource-poor countries but these tend to be worse in countries currently experiencing armed conflict or recovering from it.^{2,3} It is estimated that 170 000 maternal deaths occur yearly during humanitarian emergencies.⁴ The majority of the top ten countries with the highest maternal mortality ratios globally are experiencing or emerging from conflict.⁵ Higher rates of maternal mortality are also recorded in areas with recent conflict.⁶ In the Democratic Republic of Congo, for example, the contrast between the conflict-affected eastern part of the country and the relatively peaceful western part of the country is stark, with maternal mortality ratios of 1174 and 881 deaths per

100 000 live births, respectively.⁷ In many low- and middle-income countries, including conflict-affected countries, women of reproductive age are the main carers for children and elderly relatives, and so mortality and morbidity associated with poor reproductive health outcomes have profound long-term consequences for families and communities.⁸

Ensuring access to comprehensive health information and services, including reproductive health, is endorsed by United Nations Security Council Resolutions 1820, 1888, 1889, 1960 and 1325, which are aimed at protecting women in conflict and post-conflict situations.^{9,10} These important resolutions include targeting gender-based violence, which is often an intentional strategy of war as well as a consequence of increasing impunity in conflict-affected countries.¹¹ Essential reproductive health services and activities agreed by key governmental, inter-governmental and non-governmental agencies are contained in leading humanitarian guidelines (summarised in Box 1).^{12–15}

Investment in reproductive health is one of the most-effective ways to improve health outcomes, promote equitable and sustainable development and help alleviate poverty across generations.^{2,16,17} Most reproductive health interventions, such as family-planning services, are extremely cost-effective in improving health outcomes and preventing maternal mortality and HIV.^{18,19} The disruption caused by conflict and displacement reduces women's and men's access to family planning services.³ Recent studies have shown that the provision of comprehensive family planning services is widely accepted among conflict-affected populations.^{20,21}

Official development assistance (ODA) is a major source of the global financial response for health in low- and middle-income countries, including those currently affected by armed conflict and those which are defined as post-conflict (see definitions in Box 1). Evidence has shown that ODA for reproductive health activities, including family planning, remains low globally.²² In a previous study we analysed ODA disbursed for reproductive health activities in 18 conflict-affected countries between 2003 and 2006.²³ Our findings indicated that ODA was increasing for reproductive health to conflict-affected countries but this was largely attributable to increased funding for HIV/AIDS activities, whereas ODA for other reproductive health services was very limited. The findings also showed lower absolute reproductive health ODA per capita to conflict-affected countries than comparable non-conflict-affected countries despite generally higher levels of reproductive health needs. The study was useful for informing subsequent donor policies on reproductive health in conflict-affected countries.^{16,24–26} Further evidence of long-term trends in reproductive health ODA distribution is useful in understanding how responsive aid is to levels of reproductive health needs and to address issues of donor accountability and transparency.^{27–29}

Box 1. Key definitions

Reproductive Health follows the definition given in the International Conference on Population and Development in 1994.³⁰ It refers to the constellation of methods, techniques, and services that contribute to reproductive health and well-being by preventing and solving reproductive health problems.³¹ Reproductive activities for conflict-affected populations such as refugees and internally displaced persons include family planning, HIV/AIDS and sexually transmitted diseases, maternal and newborn health, comprehensive abortion care, and sexual and gender-based violence.¹² Note: the revised version of the Inter Agency Field Manual (2010) includes the following components in reproductive health: family planning, maternal and newborn health, comprehensive abortion care, preventing and responding to consequences of gender-based violence, STIs, HIV and adolescent reproductive health.

Official development assistance (ODA) is defined as flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, including humanitarian aid. ODA receipts comprise disbursements by bilateral donors and multilateral institutions.³²

Humanitarian aid is assistance designed to save lives, alleviate suffering, and maintain and protect human dignity during and in the aftermath of emergencies and disasters. To be classified as humanitarian, aid should be consistent with the humanitarian principles of humanity, impartiality, neutrality and independence.³³

Conflict-affected countries include those that are currently engaged in war or those that are defined as post-conflict countries. Conflict-affected countries were selected as having been in 'war' at a point in the period 2000–2009 based upon the Uppsala University Conflict Database, with additional information used from the World Bank.^{34,35} Conflict or War refers to violent armed struggle between hostile groups; there are over 1000 battle-related deaths in 1 year in our definition of conflict.³⁶ Post-conflict is highly difficult to conceptualise and may refer to the period following a formal surrender, negotiated end of hostilities, or peace talks.³⁷ It is a period with increased security and peace, although there may be violence and insecurity in certain regions; political and economic reforms and the influx of large-scale private investment and development aid. Some countries are described as post-conflict for up to two decades or more after the end of hostilities; however, this tends to be very context-specific depending on the typology of conflict. Post-conflict peace is typically fragile: nearly half of all civil wars are due to post-conflict relapses.³⁸

The overall objective of this follow-up study is to provide information on longer-term trends on ODA disbursement patterns for reproductive health activities in 18 conflict-affected countries. The specific objectives are:¹ to measure the absolute and per capita amount of reproductive health ODA to conflict-affected countries;² to compare reproductive health ODA disbursements to conflict-affected countries and non-conflict-affected countries;³ to analyse disbursement patterns of ODA disbursement for different reproductive health-related activities;⁴ to analyse disbursement patterns of reproductive health ODA by donors.

Methodology

Data source

Aid data was extracted for 2002–2011 from the open-access Creditor Reporting System (CRS) database, available at <http://stats.oecd.org/Index.aspx?datasetcode=CRS1>. CRS is maintained by the Development Assistance Committee (DAC) of the Organisation of Economic Cooperation and Development (OECD). CRS data was determined to be the most comprehensive source of information on ODA for health and has been widely used for research on tracking aid across different health sectors to all developing countries, including those affected by conflict.^{39–46} CRS covers an estimated 100% of aid disbursements from 2007, around 90% since 2002.⁴⁷ It ensures that there is little or no double-counting; data are validated by a peer-review process. Reporting is mandatory for donors that use standard criteria, allowing for comparability between donors and over time.^{47,48} Other databases such as AidData offer less standardised data than CRS, which uses the same data collection procedure across all donor agencies and is therefore considered to be the best data source for studying trends in ODA from the same set of donors over time.⁴⁹

The 18 countries selected for the study were those which met the definitions of conflict-affected and/or post-conflict (Box 1) and were the same as those used in the first study so as to ensure continuity of analysis and to study long-term patterns of aid for reproductive health for these countries. The CRS includes ODA from 26 bilateral donors and 18 multilateral agencies including UN programmes and funds, World Bank groups, regional banks, and global health initiatives such as the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM) and the US President's Emergency Plan for AIDS Relief (PEPFAR). All bilateral and multilateral donors were included in this study, as were all types of funding approaches. The CRS includes humanitarian aid; longer-term developmental programmatic or project funding; pooled funding such as common humanitarian funds for recipient countries; Sector-Wide Approaches (SWAs) and basic packages of health services; and general budget support. Bilateral and multilateral aid are recorded separately in the CRS to avoid double-counting.

This study did not include data from the Financial Tracking System (FTS) to avoid double-counting, as it does not provide additional data to that already included in CRS. We contacted a number of specialists on humanitarian funding from CRS, FTS and Global Humanitarian Assistance to verify that CRS analysis would cover all aid to conflict-affected countries including non-earmarked funding allocated by donor countries to recipient countries, and contributions to the Central Emergency Respond Fund

(CERF), Common Humanitarian Fund (CHF) and Emergency Response Fund (ERF). These emergency funds are reported in CRS by the donor countries to the recipient country and channelled through the United Nations Office for the Coordinator of Humanitarian Affairs (UN OCHA), which is specified as an aid channel flow.⁵⁰

Analysis

The methodology of analysing CRS follows that used in our previous study.²³ CRS-labelled aid activities were selected that contributed either directly or indirectly to reproductive health (Box 2). In the analysis, 100% of ODA disbursements for direct reproductive health activities were included: population policy and administration management; reproductive health care (includes reproductive health promotion, prenatal/postnatal/delivery care, safe motherhood, fertility treatment, abortion related care); family planning; personnel development for population and reproductive health; social mitigation of HIV/AIDS; and STD control, including HIV/AIDS. For the indirect activities, proportions of ODA disbursements for the following activities were allocated for inclusion in the analysis: education; basic nutrition; general health; general budget support; humanitarian material relief assistance and services; and reconstruction relief and rehabilitation (Box 2). This follows the previously used approach.^{23,39,51,52} Donor contributions include both earmarked and non-earmarked grants (non-earmarked funding means that the multilateral agency has freedom to decide how the money is used). All estimates were based on 2009 constant US dollars, using CRS deflator rates to adjust for changes in the exchange rate and inflation in the currency in which the flow occurred between the year of the flow and the base year.

All ODA data for each recipient country selected for the study were downloaded from the CRS and analysed in EXCEL and STATA databases. Each of the CRS-labelled aid activities is accompanied in the CRS database by a numeric 'purpose-code,' which was used for the data analysis. The absolute and per capita amounts of ODA (constant US\$) were analysed for each of the 18 recipient countries for individual direct and indirect reproductive health activities and for combined reproductive health.

A comparative analysis of the total reproductive health ODA was also made with ODA disbursed to comparable non-conflict-affected countries. Of the 18 conflict-affected countries, only three countries were not in the OECD/DAC category of least-developed countries: Colombia, Iraq and Sri Lanka. We therefore compared the 15 conflict-affected countries which were in the OECD/DAC category of least-developed countries with the remaining 36 non-conflict-affected countries in the least-developed country category.⁵³ The methods described above for descrip-

Box 2. Creditor reporting system activities included in the analysis

Activities (purpose code)	% Allocation	Basis for allocation
Direct activities*		
Population policy & administration management (13010)	100	Estimates based on calculations by the Netherlands Interdisciplinary Demographic Institute (NIDI) and developed in the OECD 54th meeting of the Working Party on Statistics, June 2005***
Reproductive health care (13020)**	100	
Family planning (13030)	100	
Personnel development for population & reproductive health (13081)	100	
Social mitigation of HIV/AIDS (16064)	100	
STD control, including HIV/AIDS (13040)	100	
Indirect activities		
Primary education (11220)	10	Estimates based on calculations by NIDI and developed in the OECD 54th meeting of the Working Party on Statistics, June 2005***
Basic skills for youth and education (11230)	10	
Early childhood education (11240)	10	
Secondary education (11320)	10	
Health policy & administrative management (12110)	10	
Basic health care (12220)	25	
Basic health infrastructure (12230)	25	
Basic nutrition (12240)	75	
Health education (12261)	25	
Health personnel development (12281)	25	
General budget support (51010)	2.11	Estimate based on average government expenditure on health for the 18 sampled countries (8.42%). **** 25% of this 8.42% was then allocated for RH based on NIDI estimates.
Material relief assistance and services (72010)	1.94	Estimate based upon calculation of 7.76% of humanitarian ODA being allocated to the health sector using Financial Tracking Service data for 2003–2009. ***** 25% of this 7.76% was then allocated for RH, based on NIDI estimates.
Reconstruction relief and rehabilitation (73010)	1.94	

*Direct RH categories based on categories defined in the 1994 ICPD and subsequently used in van Dalen H, Reuser M, Assessing size and structure of worldwide funds for population and AIDS activities, UNFPA/UNAIDS/NIDI Resource Flows Project, 2005, www.resourceflows.org/index.php?module=uploads&func=download&fileid=99 (accessed 17 March 2015).

**Reproductive health care includes promotion of reproductive health; prenatal and postnatal care including delivery; prevention and treatment of infertility; prevention and management of consequences of abortion; safe motherhood activities.

***de Bruijn & Horstman.⁵²

****Source: WHO (2007). World Health Statistics. Geneva: World Health Organization.

*****Source: UNOCHA (2012). The Global Humanitarian Aid Database: Financial Tracking System. <http://fts.unocha.org/> (accessed 17 March 2015).

tively analysing the data for conflict-affected countries were used for the 36 non-conflict-affected countries. We also examined the association between a country's conflict status and receiving RH ODA disbursement through a series of multivariate linear regression analyses. The outcomes related to mean 2002–2011 per capita US\$ RH ODA. The exposure of interest was a binary variable of 'conflict-affected' (i.e. the 15 conflict-affected least-developed countries) compared with non-conflict-affected (i.e. the 36 non-conflict-affected least-developed countries). We modelled conflict status against mean per capita RH ODA received per disbursement in five separate regression models using the following dependent variables¹: mean per capita overall RH ODA,³ mean per capita direct RH ODA (see Box 2),³ mean per capita HIV/AIDS only ODA (purpose codes

13040 and 16064, see Box 2);⁴ mean per capita reproductive health care ODA (purpose code 13020, see Box 2); and⁵ mean per capita family planning ODA (purpose code 13030, see Box 2). To adjust for the potential confounding effect of variables related to health outcomes, economic status and governance, we used a step-wise multivariate regression model. First, we included the following independent variables in our model: key reproductive health indicators (HIV prevalence rate, maternal mortality, and total fertility rate), key economic data (GDP per capita) and governance (government effectiveness and control of corruption) for each recipient country – see Supporting Information Table S1 for these data and the sources. These were all entered as categorical variables. Using backward stepwise elimination, we eliminated variables that were not

statistically significant ($P < 0.01$) associated with our outcome, until we reached a model where every variable included was significantly associated. Our final multivariate models are adjusted for categories of HIV prevalence rate, GDP per capita, government effectiveness and control of corruption. We present here the association coefficients reflecting the unit decrease/increase in the continuous RH ODA outcomes according to conflict status per disbursement.

The pattern of reproductive health ODA distribution and reproductive health needs to the individual conflict-affected countries were explored descriptively through the use of scatter plots for specific reproductive health indicators (indicator data taken from the sources in Table S1) and the average annual (2002–2011) per capita ODA specifically for their most closely related CRS purpose code activity (see Box 2 for the purpose codes): HIV/AIDS prevalence and HIV/AIDS and STD control and social mitigation of HIV/AIDS (purpose codes 16064 and 13040 combined), maternal mortality rates and reproductive health care ODA (purpose code 13020); and total fertility rate and family planning ODA (purpose code 13030).

We also ran three multivariate linear regression models further to examine the association between reproductive ODA disbursements and reproductive health needs among all the conflict-affected countries combined while adjusting for potential confounders. The first model examined the association of a dependent continuous variable of mean 2002–2011 per capita US\$ ODA per disbursement for HIV/AIDS (purpose codes 13040 and 16064) and HIV prevalence, with HIV prevalence data categorised into equal distribution quartiles to aid interpretation. The second model examined the association of mean 2002–2011 per capita US\$ ODA per disbursement for reproductive health care (purpose code 13020) with maternal mortality, with maternal mortality ratios categorised equally into tertiles. The third model examined the association of mean 2002–2011 per capita US\$ ODA per disbursement for family planning (purpose code 13030) with total fertility rate which was again categorised equally into tertiles. We used stepwise regression for each of these models, beginning first with the full range of possible confounders noted above and eliminating those that were not statistically significantly associated with the outcome of interest ($P < 0.01$). The confounders controlled for in each final multivariate model are listed in Table 3.

Results

The distribution of ODA for reproductive health to the 18 conflict-affected countries is shown in Table 1. ODA for reproductive health to the 18 conflict-affected countries increased by 298%, from US\$ 303.5 million in 2002 to US\$

1,208.9 million in 2011 (compared with a 178% increase in all ODA), with an annual average of US\$ 747.0 million disbursed to conflict-affected countries for reproductive health activities during the study period. This equates to US\$ 1.93 in reproductive health ODA per person per year to conflict-affected countries, 3% of all ODA during the study period (annual average all ODA of US\$ 24,568.5 million; US\$ 63.2 per capita; see Supporting Information Table S2). The conflict-affected countries receiving the highest annual average per capita reproductive health ODA were Uganda (US\$ 8.1), Timor-Leste (US\$ 6.7) and Liberia (US\$ 5.4); and the countries receiving the lowest were Colombia (US\$ 0.2), Myanmar (US\$ 0.4), and Sri Lanka (US\$ 0.7).

The distribution of reproductive health ODA disbursed to the 15 of the 18 conflict-affected countries which were classified as 'least developed countries' was compared with equivalent non-conflict-affected least developed countries (Table 1).⁵³ The data show that the annual average per capita reproductive health ODA disbursed to non-conflict-affected least developed countries (US\$ 3.60) was 57% higher than to least developed conflict-affected countries (US\$ 2.30). In addition, 4.4% of all ODA disbursed to conflict-affected least developed countries was for reproductive health activities, compared with 7.0% in non-conflict-affected least developed countries.

The relation between countries being conflict-affected and levels of reproductive health ODA disbursements was investigated through the multivariate regression analysis (Table 2). After adjustment for the potential confounders, our findings suggest that being a conflict-affected least developed country (compared with a non-conflict-affected least developed country) is associated with receiving lower per capita all reproductive health ODA per disbursement ($B = -0.00021$; $P = 0.056$), lower per capita direct reproductive health ODA per disbursement ($B = 0.00030$; $P = 0.024$), lower HIV/AIDS-specific ODA per disbursement ($B = -0.00002$; $P = 0.967$), but increased reproductive health care ODA per disbursement ($B = 0.00205$; $P = 0.05$) and increased family planning ODA per disbursement ($B = 0.00119$; $P = 0.005$).

The activities to which the reproductive health-related ODA to conflict-affected countries was disbursed are given in Box 2 (and detailed in Supporting Information Table S3). Of the US\$ 747 million disbursed on average per year to conflict-affected countries for reproductive health activities, two-thirds (66.2%) was for direct reproductive health activities. The data show that an annual average of US\$ 322.69 million was disbursed for HIV/AIDS activities (purpose codes for 'HIV/AIDS and STD control' and 'Social mitigation of HIV/AIDS'). This represents 43.2% of the US\$ 747 million in ODA average annual disbursements for reproductive health (direct and indirect). The average annual ODA disbursed for direct reproductive

Table 1. ODA disbursement to conflict-affected countries 2002–2011

Country	RH ODA (US \$ million)											Mean All ODA 2002–2011 (US \$ Million)*	Annual average ODA per capita (US \$)	RH as % of all ODA		
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Mean 2002–2011				% from direct RH ODA**	
															RH ODA	All ODA*
Afghanistan	24.6	42.0	53.6	67.0	78.4	99.0	112.7	171.5	159.3	185.4	99.3	50.9	3910.7	3.7	144.7	2.5
Angola	26.1	30.9	25.8	40.8	42.5	37.6	21.7	22.9	18.5	32.7	29.9	78.4	483.5	1.9	31.3	6.2
Burundi	9.9	11.8	18.5	24.5	30.9	29.2	15.0	23.2	33.2	47.6	24.4	71.5	584.6	2.8	67.3	4.2
CAR	7.0	7.8	13.4	11.4	15.4	7.5	2.6	4.9	6.0	16.4	9.2	74.3	245.8	2.0	54.4	3.8
Chad	18.4	21.0	22.9	30.1	19.8	14.0	7.6	7.8	8.6	33.9	18.4	73.0	423.3	1.9	43.7	4.4
Colombia***	4.2	5.3	3.6	7.0	11.1	7.4	5.0	3.8	4.6	18.3	7.0	57.2	891.2	0.2	21.1	0.8
DRC	44.5	42.2	48.6	73.0	76.4	83.3	69.5	92.8	112.9	172.2	81.5	58.2	3512.6	1.3	55.3	2.3
Eritrea	16.7	24.0	28.9	28.6	16.6	19.6	9.1	6.3	6.1	13.4	16.9	74.3	206.5	3.2	39.2	8.2
Iraq***	1.8	20.1	45.6	137.9	100.7	62.9	21.7	25.3	16.6	12.7	44.5	2.3	7152.4	1.6	263.3	0.6
Liberia	2.9	4.6	9.2	10.4	11.2	20.0	15.6	26.1	26.9	46.3	17.3	67.4	541.1	5.4	168.5	3.2
Myanmar	12.0	21.7	22.5	34.9	17.8	24.3	16.3	9.8	13.7	44.3	21.7	74.7	233.6	0.4	4.5	9.3
Nepal	35.5	43.0	41.8	48.8	65.2	47.7	48.6	56.0	53.5	67.1	50.7	72.6	650.4	1.8	23.5	7.8
Sierra Leone	8.5	9.8	15.3	19.9	15.7	18.7	12.5	29.5	36.2	40.3	20.6	68.0	535.1	4.3	110.2	3.9
Somalia	4.3	4.2	4.8	13.2	16.1	18.5	8.2	19.6	8.1	35.2	13.2	44.9	436.6	1.5	48.2	3.0
Sri Lanka***	8.3	8.1	7.4	16.1	24.2	16.0	11.0	14.3	16.4	15.6	13.7	43.4	1002.2	0.7	49.1	1.4
Sudan	12.2	12.5	21.3	56.4	63.3	50.6	36.2	49.7	64.3	54.6	42.1	49.4	1514.1	1.4	49.1	2.8
Timor-Leste	2.2	3.4	5.9	5.8	8.1	7.2	6.1	4.9	12.1	12.7	6.8	59.1	271.8	6.7	267.9	2.5
Uganda	64.3	99.5	178.8	205.8	218.5	298.1	258.5	295.6	314.1	360.5	229.4	88.2	1973.0	8.1	69.7	11.6
All Conflict****	303.5	412.0	567.9	831.7	831.7	861.6	677.7	864.0	911.3	1208.9	747.0	66.2	24 568.5	1.9	63.2	3.0
LDC Conflict*****	289.1	378.4	511.3	670.6	695.8	775.2	640.1	820.6	873.7	1162.3	681.7	71.0	15 522.7	2.3	53.4	4.4
Non-Conflict LDCs*****	740.6	1028.3	1288.7	1486.4	1709.3	2135.6	1741.7	1939.0	2068.3	3136.2	1727.4	78.9	24 635.1	3.6	51.3	7.0

CAR, Central Africa Republic; DRC, Democratic Republic of the Congo; GDP, gross domestic product; LDC, least-developed countries; NA, not available; ODA, official development assistance; RH, reproductive health; US \$, US dollars.

All data are in constant US\$ with 2011 as the base year, using deflator rates used by CRS to incorporate donor exchange rate differences and inflation during the period in question.

Population data from: US Census Bureau (www.census.gov/population/international/data/db/informationGateway.php).

*See Table S1 for All ODA disbursements by year.

**Proportion (%) of mean RH ODA (2002–2011) from the direct RH ODA activities shown in table.

***Non-LDC conflict-affected countries.

****Total for all 18 conflict-affected countries (both LDC and non LDC).

*****Total for the 15 conflict-affected countries in the LDC category.

*****Total for 36 non-conflict-affected countries in the LDC category.

Data in bold represent total amounts for the different combined country groupings.

Table 2. Regression analyses on association between countries being conflict-affected and mean per capita RH ODA (2002–2011)

RH ODA category model	Bivariate models			Multivariate models*		
	Coefficient	95% CI	P	Coefficient	95% CI	P
All RH ODA model						
Non-conflict LDC	Ref			Ref		
Conflict-affected LDC	−0.0018626	−0.00249; −0.00123	<0.001	−0.00021	−0.00043; −0.0000005	0.056
Direct RH ODA model						
Non-conflict LDC	Ref			Ref		
Conflict-affected LDC	−0.0021908	−0.00296; −0.00142	<0.001	−0.00030	−0.00056; −0.00004	0.024
HIV/AIDS ODA model						
Non-conflict LDC	Ref			Ref		
Conflict-affected LDC	−0.0019187	−0.00299; −0.00084	<0.001	−0.0000199	−0.00095; −0.000909	0.967
Reproductive health care ODA model**						
Non-conflict LDC	Ref			Ref		
Conflict-affected LDC	0.0011517	−0.00167; 0.003972	0.423	0.00205	0.00617; 0.00349	0.005
Family planning ODA model						
Non-conflict LDC	Ref			Ref		
Conflict-affected LDC	0.0003792	−0.0003; 0.001062	0.276	0.00119	0.00041; 0.00200	0.003

LDC, least developed country; ODA, official development assistance; Ref; reference category.

*Each of the five multivariate regression models run separately after stepwise elimination of non-significant variables. All final models adjusted for HIV prevalence rate, GDP per capita, government effectiveness and control of corruption.

**Reproductive health care includes reproductive health promotion, prenatal/postnatal/delivery care, safe motherhood, fertility treatment, abortion related care (see Box 2).

health activities, excluding HIV/AIDS activities, was \$172.2 million, or 23.0% of the average annual ODA disbursed for all reproductive health activities. The most significant disbursements for the non-HIV reproductive health activities were for reproductive health care (purpose code 13020) (13.3%) and basic health care (10.5%) (purpose code 12220). Over half (56.3%) of the 298% increase in total reproductive health disbursements during the study period was due to the substantial increase in HIV/AIDS funding. Reproductive health care activities accounted for 19.3% of the 298% increase.

The dominance of HIV/AIDS funding as a proportion of total reproductive health funding (direct and indirect) is greater in the conflict-affected least developed countries (53.2%) than in the non-conflict-affected least developed countries (39.5%) despite the latter generally appearing to have higher prevalences of HIV/AIDS and lower levels of other types of reproductive health needs (Supporting Information Tables S1 and S4).

These relationships between mean per capita reproductive health ODA disbursements (2002–2011) and reproductive health needs are shown in the regression analyses in Table 3. The findings suggest a general lack of response of reproductive health ODA to reproductive health needs, and in some categories of need for conflict-affected countries. Indeed, countries with a high maternal mortality ratio category of >1000 had a negative associa-

tion ($B = -0.01701$; $P < 0.001$) with reproductive health care ODA (purpose code 13020) when compared with those with a lower maternal mortality ratio category of ≤ 650 . Similarly, countries with a higher HIV prevalence of >10% had a negative association ($B = 0.00100$; $P = 0.001$) with HIV/AIDS ODA (purpose codes 16064 and 13040 combined) when compared with those with a lower prevalence category of <1.0%. However, ODA for family planning appeared to be more responsive to need ($B = 0.01839$; $P = 0.03$), with a higher total fertility rate category (>6.0) associated with higher family planning ODA (purpose code 13030) compared with a lower fertility rate category of ≤ 4.50 . The unadjusted patterns between per capita reproductive health ODA disbursements and reproductive health needs for individual countries are given in the scatter plots in Supporting Information Figure S1. These show that a number of countries (e.g. Chad, Somalia, Central Africa Republic, and the Democratic Republic of Congo) with high reproductive health needs receive considerably less per capita ODA than other conflict-affected countries with lower reproductive health needs.

The disbursement patterns by donor are provided in Supporting Information Table S5. The donors disbursing the highest amount of absolute bilateral reproductive health-related ODA were the USA (with increases in US ODA in 2008 and 2009 largely accounting for the substan-

Table 3. Regression analyses on association of reproductive health ODA with reproductive health needs among conflict-affected countries

RH ODA category model*	Bivariate			Multivariate**		
	Coefficient	95% CI	P	Coefficient	95% CI	P
Model 1: HIV/AIDS ODA						
≤1.0% prevalence	Ref			Ref		
1.01–2.0% prevalence	0.00070	−0.0012; 0.00261	0.469	0.003150	−0.0000009; 0.006309	0.051
2.01–10.0% prevalence	0.00184	0.00053; 0.00315	0.006	0.0000653	−0.002126; 0.00226	0.953
>10.0% prevalence	0.00484	0.00195; 0.00773	0.001	−0.00100	−0.01576; −0.00413	0.001
Model 2: Reproductive health care ODA***						
MMR ≤650	Ref			Ref		
MMR 651–1000	−0.00306	−0.00481; −0.0013	0.001	0.01911	0.0133; 0.02491	<0.001
MMR >1000	−0.00081	−0.00221; 0.00058	0.252	−0.01701	−0.02195; −0.01208	<0.001
Model 3: Family planning ODA						
TFR ≤4.50	Ref			Ref		
TFR 4.51–5.9	−0.00018	−0.01098; −0.01062	0.974	−0.01027	−0.02286; 0.00232	0.110
TFR >6.0	0.00477	0.00059; 0.00895	0.025	0.01839	0.00138; 0.03540	0.034

MMR, maternal mortality ratio; ODA, official development assistance; Ref, Reference category; TFR, total fertility rate.

*Mean 2002–2011 per capita US\$ ODA for: HIV/AIDS only ODA (model 1); RH care only ODA (model 2); and family planning ODA (model 3).

**Each of the three multivariate regression models run separately after stepwise elimination. Final Model 1 adjusted for maternal mortality ratio, fertility rate and government effectiveness. Final Model 2 adjusted for HIV prevalence, fertility rate, GDP per capita and government effectiveness. Final Model 3 adjusted for HIV prevalence, maternal mortality ratio, GDP per capita and government effectiveness.

***reproductive health care includes reproductive health promotion, prenatal/postnatal/delivery care, safe motherhood, fertility treatment, abortion related care (see Box 2).

tial increase in all reproductive health ODA to the conflict-affected countries – albeit mostly for HIV/AIDS), Japan, Germany and the UK. The bilateral donors disbursing the highest proportion of their ODA to reproductive health were Ireland (9.3%), Denmark (5.1%) and Iceland (4.2%). Newer bilateral donors such as Czech Republic, South Korea and the United Arab Emirates reported ODA for reproductive health in CRS, but not in very significant amounts. Multilateral donors disbursing the highest amount of absolute reproductive health-related ODA were the World Bank and the European Union.

Discussion

Main findings

There was a substantial increase (298%) in ODA funding for reproductive health activities to the 18 conflict-affected countries between 2002 and 2011. This includes recent increases in ODA for previously neglected topics such as family planning in 2008 and 2009. Similarly, ODA for the reproductive health care category purpose code increased in 2008, 2009, 2010 and 2011, which addresses critical interventions such as maternal health care. This perhaps reflects increasing advocacy and engagement in reproductive health humanitarian programming.^{13,54–56} However, the majority of the increase in overall reproductive health

funding during the review period is explained by increased ODA for HIV/AIDS activities.

This study also shows that non-conflict-affected least-developed countries received 57% more reproductive health ODA per capita compared with the conflict-affected least-developed countries during the decade reviewed, supporting findings from other studies.⁵⁷ After adjustment for potential confounding factors, the disparity largely remained. The new findings also show considerable aid disparity between conflict-affected countries, with certain countries with extremely high reproductive health needs (such as those with high maternal mortality and other health needs as shown in Table S1) receiving considerably fewer funds compared with other countries with lower reproductive health needs. The regression analysis provides additional evidence of this disparity between reproductive health needs and ODA among conflict-affected countries, with the exception of family planning. Potential explanations for the disparity in reproductive health funding towards conflict-affected countries include concerns over security, absorptive capacity and governance in the recipient countries, and varying media and policy attention.

The findings suggest there remains a substantial shortfall in ODA to meet reproductive health needs, which are estimated to be \$70 billion annually in 2015 globally.^{58,59} Resource requirements for sustaining the current use of

contraception by 260 million women in the 69 poorest countries is estimated to be approximately US\$ 10 billion over 8 years from 2012 to 2020.⁶⁰ However, there are no current reliable estimates of reproductive health needs and related funding for reproductive health activities in conflict-affected countries. Also, estimates of resource requirements for reproductive health ODA in resource-poor countries are thought to be misleadingly low, as they do not take into account crucial service delivery costs, which are likely to be higher in conflict-affected countries because of logistical challenges.⁶¹

Strengths

This study provides evidence of long-term trends in reproductive health ODA distribution for conflict-affected countries using the CRS reporting system. Analysis presented in this study shows that there is considerable disparity in the disbursement of reproductive health ODA between conflict-affected and non-conflict-affected countries (as well as between conflict-affected countries). The findings are useful in understanding how responsive aid is to levels of reproductive health needs in conflict-affected countries.

Limitations

There are a number of administrative limitations with the CRS reporting system. Our aid data review period (2002–2011) does not capture recent significant donor commitments for reproductive health such as the Global Strategy for Women's and Children's Health to mobilise US\$ 40 billion to save the lives of 16 billion women and children over 5 years, and other significant donor pledges for family planning including for post-conflict countries.^{60,62–64} However, complete disbursement data relating to these pledges will not yet show in CRS.

The CRS database does not include a purpose code for gender-based violence (GBV). Aid activities related to gender-based violence (GBV) are often also included in larger projects under human rights activities, protection, elections and post-conflict peace-building activities. It is not possible to apportion a percentage for GBV from these more general and large-scale projects. A separate purpose code for GBV would enhance significantly understanding of patterns of aid allocations for this crucial issue.²³

For the CRS purpose code on 'STD control, including HIV/AIDS', it not possible to disaggregate funding for HIV from other STDs and so we cannot examine funding for other STDs. We are also not able to disaggregate funding for the 'Reproductive Health Care' purpose code (for example, for delivery care or comprehensive abortion care).

This study was limited to estimating donor aid disbursements at national levels, so it is not possible to know what proportion of aid disbursement is spent on the ground and

with which populations. We could not therefore determine how ODA was disbursed to conflict-affected regions and populations within each of the conflict-affected countries. This is especially relevant in conflict-affected countries as conflicts tend to occur in geographically distinct areas (e.g. Sudan, Sri Lanka and northern Uganda). A related limitation is that South Sudan has not yet been included as a separate country by CRS after becoming an independent state in 2011, and so aid disbursements to South Sudan are included under Sudan.

It is difficult to estimate what percentage of a country's population is affected by conflict and how that may have changed over the study period. In addition, as rigorous and representative reproductive health data are insufficiently recorded with conflict-affected populations, we have been forced to use national-level data for our models. There is a critical need for more reproductive health data specifically from conflict-affected populations. There is also a need for in-depth, country- and local region-specific research to investigate the ground-level disbursement of reproductive health ODA.

Countries affected by natural disasters and/or undergoing political conflict, such as Syria, or transition, such as other Arab Spring countries, have also been excluded from this study in order to maintain a distinctive focus on countries affected by major armed conflict during the study period from 2002 to 2011. Several reports have described the challenges of reproductive health in disaster-affected countries and the Arab Spring countries.^{65,66} Further studies are necessary to track ODA for these groups of countries.

Aid from other bilateral donors such as the BRICS (Brazil, Russia, India, China, and South Africa) and Turkey (which provides significant amounts of humanitarian assistance), is not currently included in CRS. Studies suggest that the aid flows of such donors have nearly quadrupled, from an estimated 8.1% of total development assistance in 2000 to 30.7% of the total in 2009.^{67,68} Aid from private, philanthropic and non-governmental organisations is also excluded from our study, as most of these organisations do not currently report their aid disbursements to CRS. The Bill and Melinda Gates Foundation has been reporting some of its funding to CRS since 2009 under a private grants category. This has not been analysed in this study as it does not constitute ODA and is not comprehensive or standardised enough to offer sufficiently reliable data on disbursements to conflict-affected countries.⁶⁹ Contributions from these emerging and large private donors have become an increasingly relevant source of financing in recent years, with some major private donors rivalling many traditional multilateral and bilateral donors in terms of the scale of their funding. Global Humanitarian Assistance provides analysis of funding from private organisations but it is not possible to disaggregate their data into

sectors such as reproductive health.⁶⁸ Increased aid reporting by private organisations to a centralised data repository such as CRS would significantly enhance the efficiency and effectiveness of this important sector.³⁹

Finally, although we used multivariate regression analysis to adjust for potential confounders when examining the relationships between conflict status and reproductive health ODA and also between reproductive health needs and reproductive health ODA, it is probable that there are unobserved confounders which may have a significant influence on these relationships.

Interpretation

The findings suggest reproductive health aid disparities to and between conflict-affected countries. In-depth, country-specific research is required to investigate the supply and demand characteristics of reproductive health ODA. The findings from such research can help inform advocacy initiatives to improve donor accountability and co-ordination, and ensure more equitable distribution of ODA to meet the reproductive health needs of populations affected by conflict.

Conclusion

The evidence presented in this study tracking 10 years of reproductive health aid disbursements suggests that although there is some room for optimism from the increase in ODA for reproductive health for conflict-affected countries from 2002 to 2011, the bulk of the increased funding is attributable to HIV/AIDS activities, and other reproductive health activities have not benefited from such increases. Importantly, there is also a disparity in the disbursement of reproductive health ODA between conflict-affected and non-conflict-affected countries (as well as between conflict-affected countries). The funding inequities presented in this study remain substantial obstacles for conflict-affected countries which remain highly dependent on ODA and are the furthest away from achieving the MDGs.^{70,71}

Disclosure of interests

None declared. Completed disclosure of interests form available to view online as supporting information.

Contribution to authorship

PP conceptualised the paper and developed the study methodology, with contributions from BR, MD and MT. MD and BR primarily conducted the data analysis, which was reviewed by AM. PP wrote the first draft of the paper with contributions from BR. MT, SG, LE contributed to the writing process. All authors reviewed and approved the final text.

Details of ethics approval

No ethical approval was required for this study as all data used for the study is available in the public domain.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1. Maternal mortality and reproductive health care ODA

Table S1. Key reproductive health and socio-economic indicators for conflict- and non-conflict-affected least developed countries

Table S2. All ODA (US \$ million) to conflict-affected countries, by year

Table S3. Distribution of reproductive health ODA 2002-2011 to conflict-affected countries, by activity (US \$ million)

Table S4. Comparison of HIV only disbursements versus disbursements for all other direct and indirect reproductive health activities, by conflict status

Table S5. Donor disbursement of reproductive health ODA for sampled conflict-affected countries (US \$ million) ■

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