DONOR EPIDEMIOLOGY IN THE REGION

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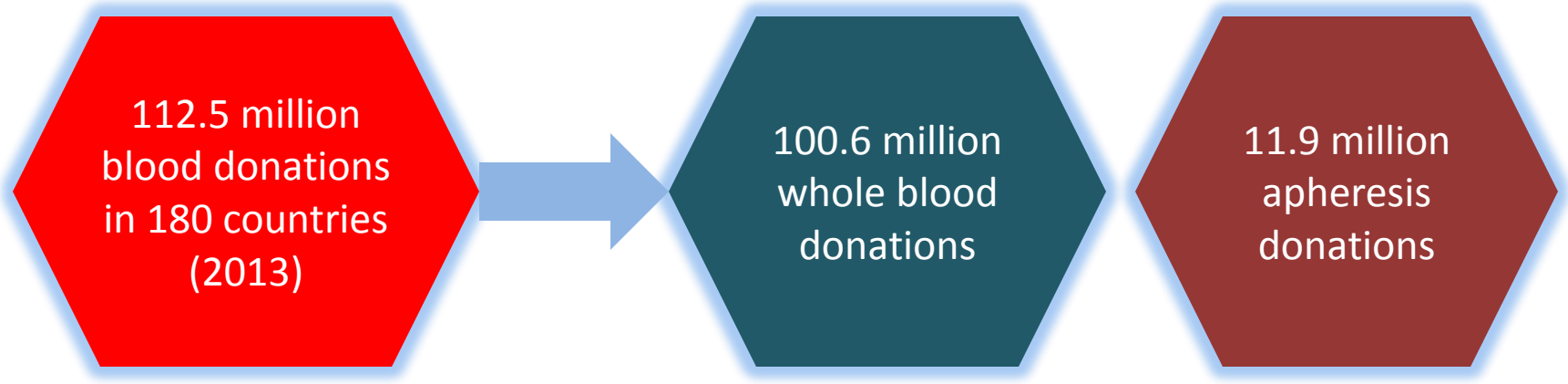
Outline

1. Introduction
2. Blood donation figures within WHO region
3. Prevalence of Infection: Donors vs Population, within SEAR & WPR
4. Donation screening
5. Malaysia/NBC Central Region epidemiology
6. Conclusion

INTRODUCTION

Information on the infection risk in a specific donor population

Essential measures taken (Donor selection & donor testing) to ensure blood safety through an adequate selection of blood and plasma donors[1]



WHO GLOBAL STATUS REPORT ON BLOOD SAFETY AND AVAILABILITY 2016

1. European Medicines Agency, (2016) Guideline on epidemiological data on blood transmissible infections (EMA/CHMP/BWP/548524/2008 rev 1)

- Bangladesh
- Bhutan
- Democratic People's Republic of Korea
- India
- Indonesia
- Maldives
- Myanmar
- Nepal
- Sri Lanka
- Thailand
- Timor-Leste



- Australia
- Brunei Darussalam
- Cambodia
- China
- Cook Islands
- Fiji
- Japan
- Kiribati
- Lao People's Democratic Republic
- Malaysia
- Marshall Islands
- Micronesia (Federated States of)
- Mongolia
- Nauru
- New Zealand
- Niue
- Papua New Guinea
- Philippines
- Republic of Korea
- Samoa
- Singapore
- Solomon Islands
- Tuvalu
- Vanuatu
- Vietnam

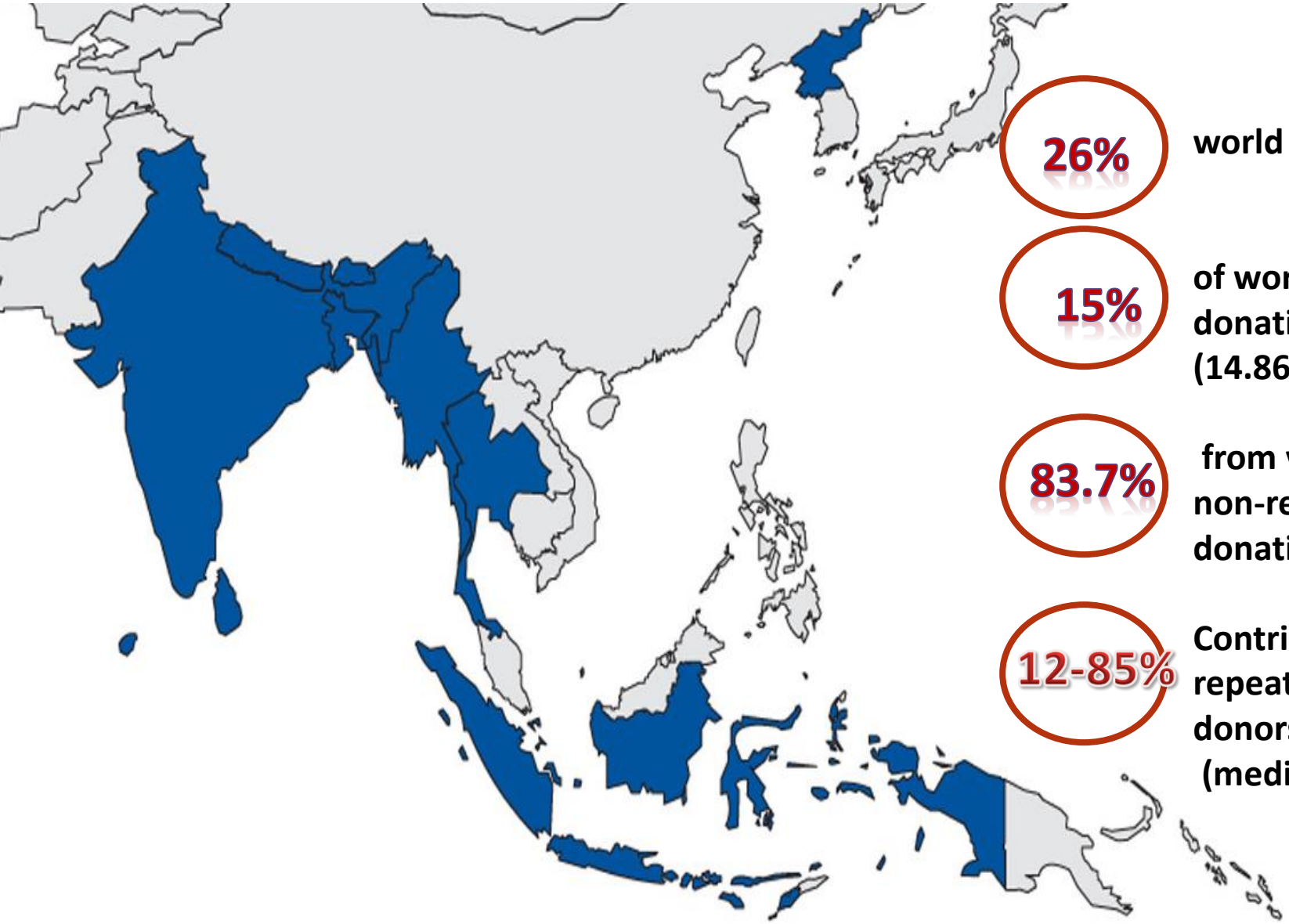
– Data for Palau and Tonga were not included

SOUTH EAST ASIA & WESTERN PACIFIC

Estimated blood donations by WHO region 2013

Region	Estimated whole blood donations (millions)	Estimated apheresis donations (millions)	Total (millions)
Africa	5.6	0.03	5.6
Americas	20.4	2.0	22.4
Eastern Mediterranean	9.9	0.04	9.9
Europe	26.5	6.1	32.5
South-East Asia	16.6	0.06	16.7
Western Pacific	21.6	3.7	25.3
Global (rounded totals)	100.6	11.9	112.5

WHO South-East Asia Region (SEAR)



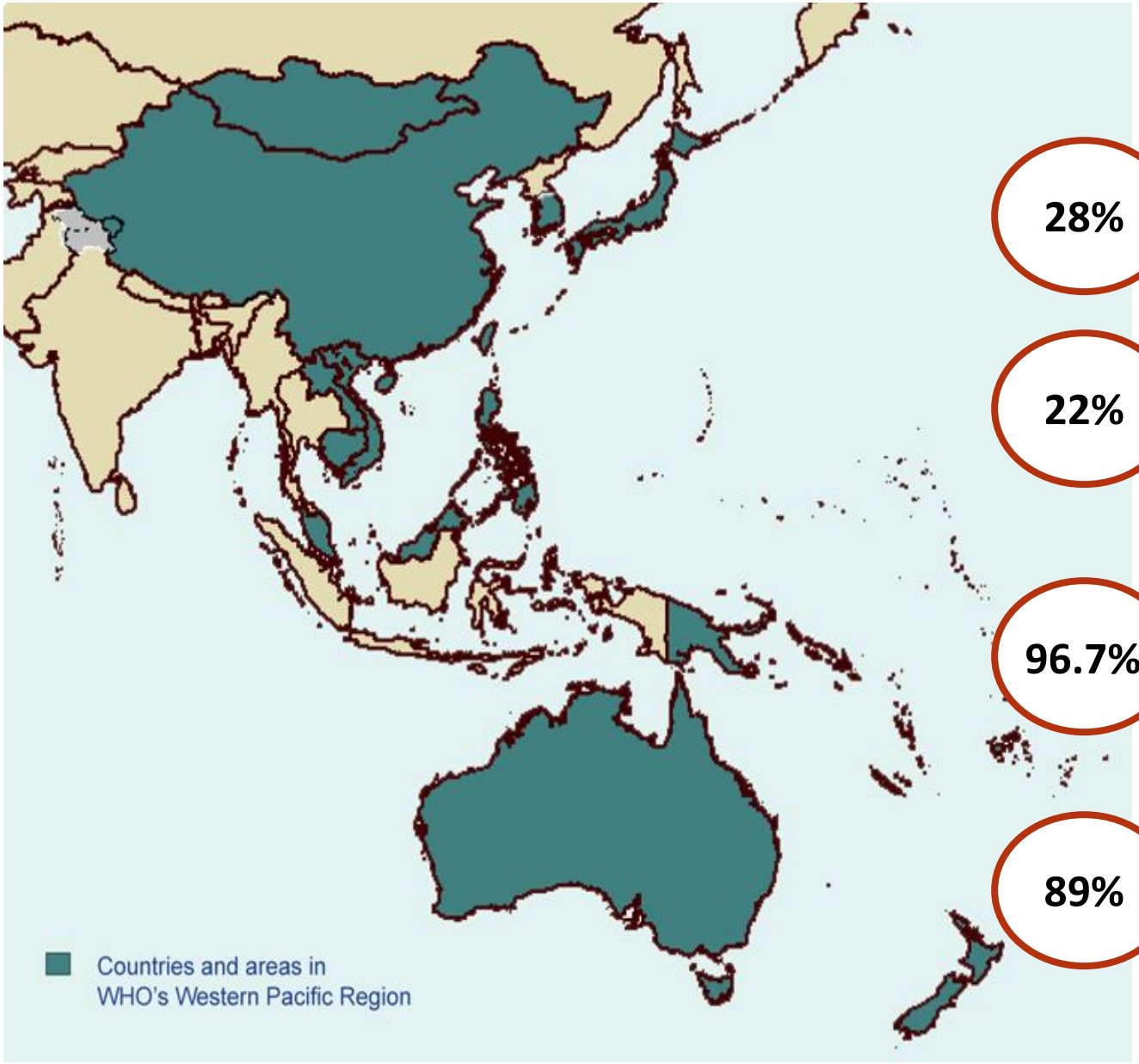
26% world population

15% of world blood donation (14.86 million)

83.7% from voluntary non-remunerated donations

12-85% Contribution from repeat blood donors (median 47%)

WHO Western Pacific Region (WPR)



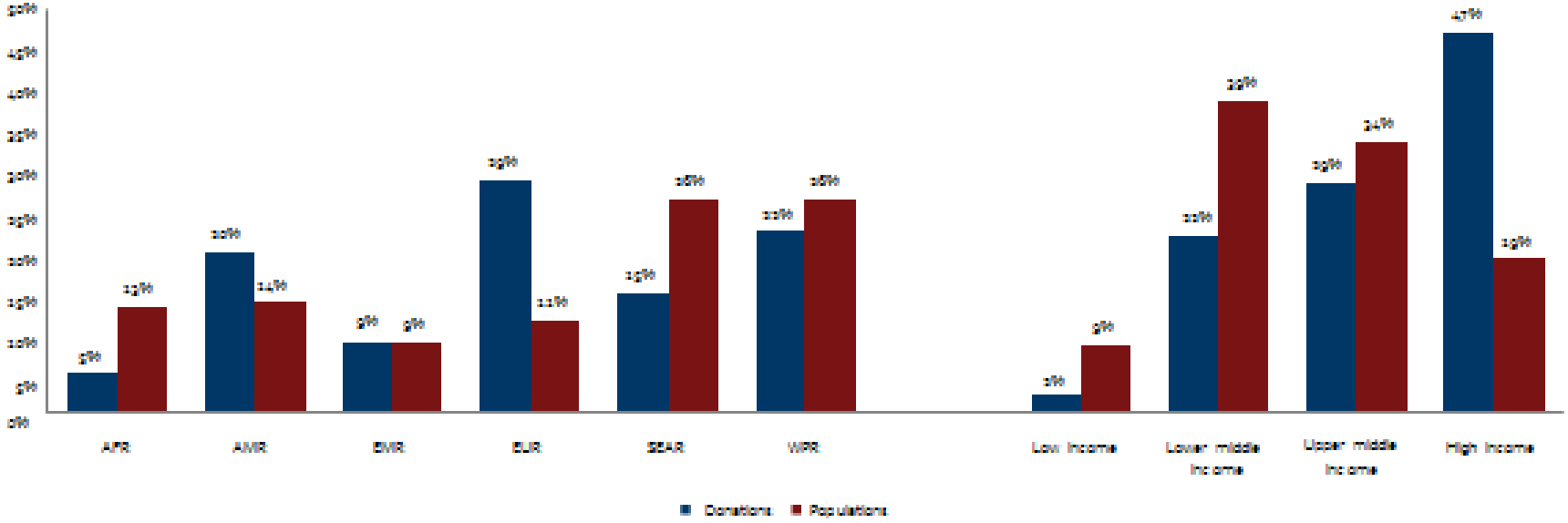
28% world population

22% of world blood donation (21.17 million)

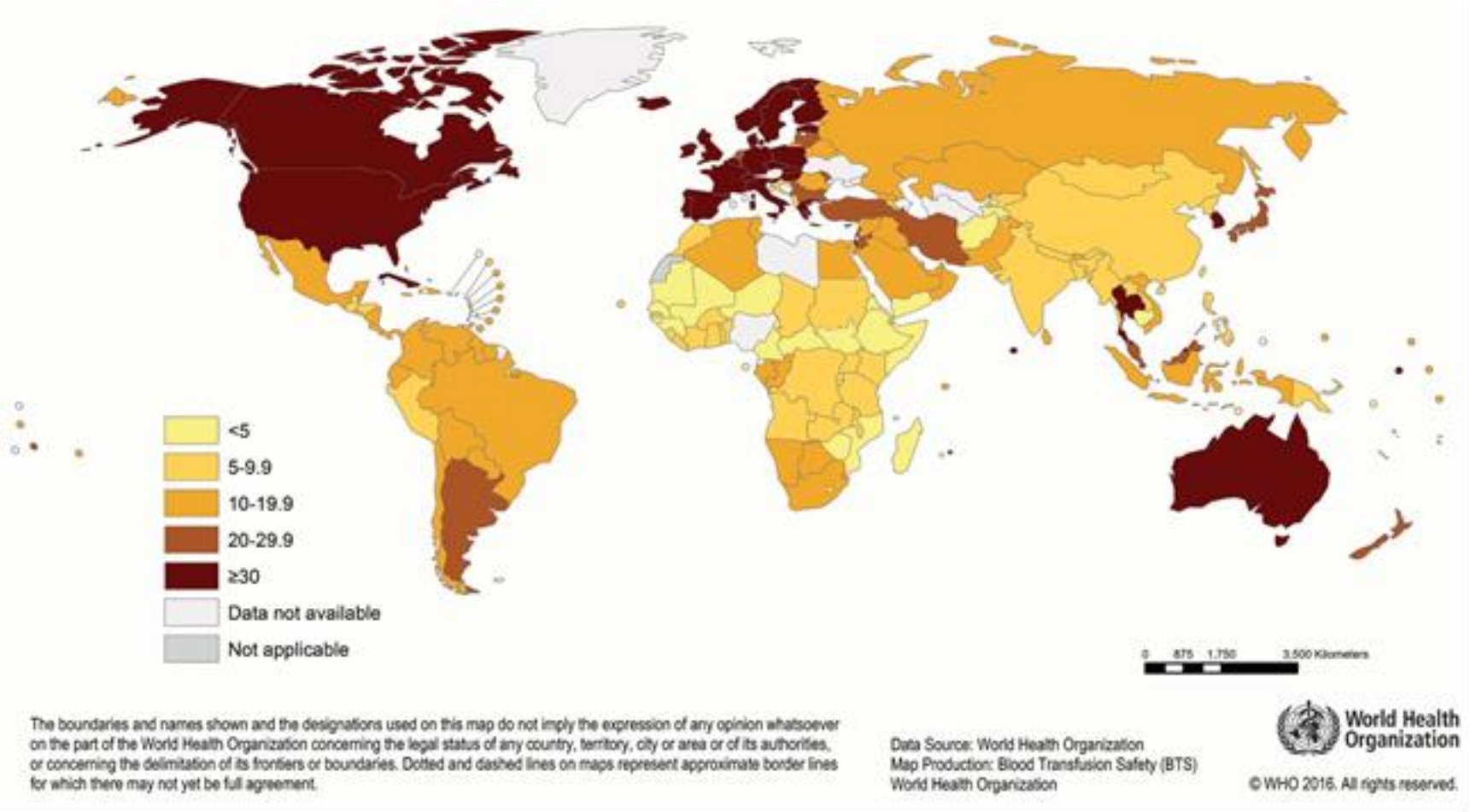
96.7% from voluntary non-remunerated donations

89% repeat blood donors (median 48%)

Regional distribution of population and blood donations by WHO region and World Bank income group, 2013



Whole blood donations per 1000 population, 2013



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

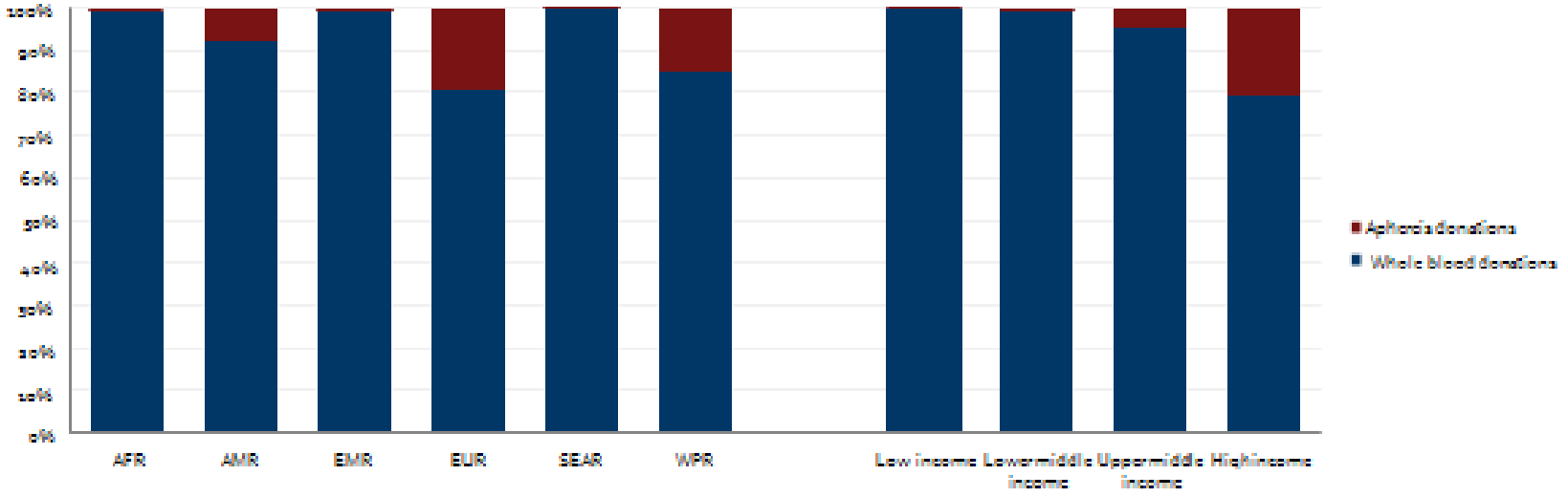
Data Source: World Health Organization
Map Production: Blood Transfusion Safety (BTS)
World Health Organization

World Health Organization

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- wide variations in blood donation rates among countries, ranging from 0.3 to 56 per 1000 population.

Method of collection of blood donations by WHO region and World Bank income group, 2013



Prevalence of infection in the donor and general population

- HIV
- Hepatitis B
- Hepatitis C

Prevalence of markers of infection in blood donations

- Prevalence of an infection among blood donations directly related to the safety of the blood supply
- impact on:

1. the residual risk of distributed blood products for transfusion
2. risk due to errors in blood quarantine and release

- Prevalence of an infection in blood donations is dependent on :

1. prevalence of an infection in the population
2. the effectiveness of donor recruitment and selection processes

PREVALENCE OF HIV AMONG POPULATION AND DONOR

Asia & The Pacific (2016)

5.1 million people living with HIV

0.2% adult HIV prevalence

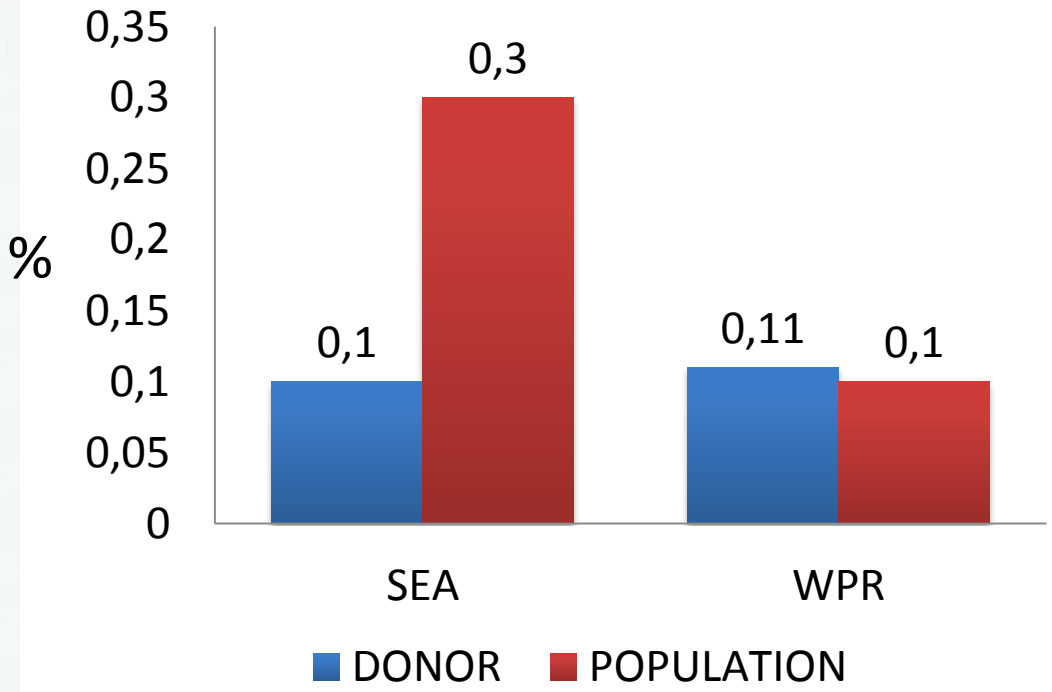
270,000 new HIV infections

170,000 AIDS-related deaths

47% adults on antiretroviral treatment

40% children on antiretroviral treatment

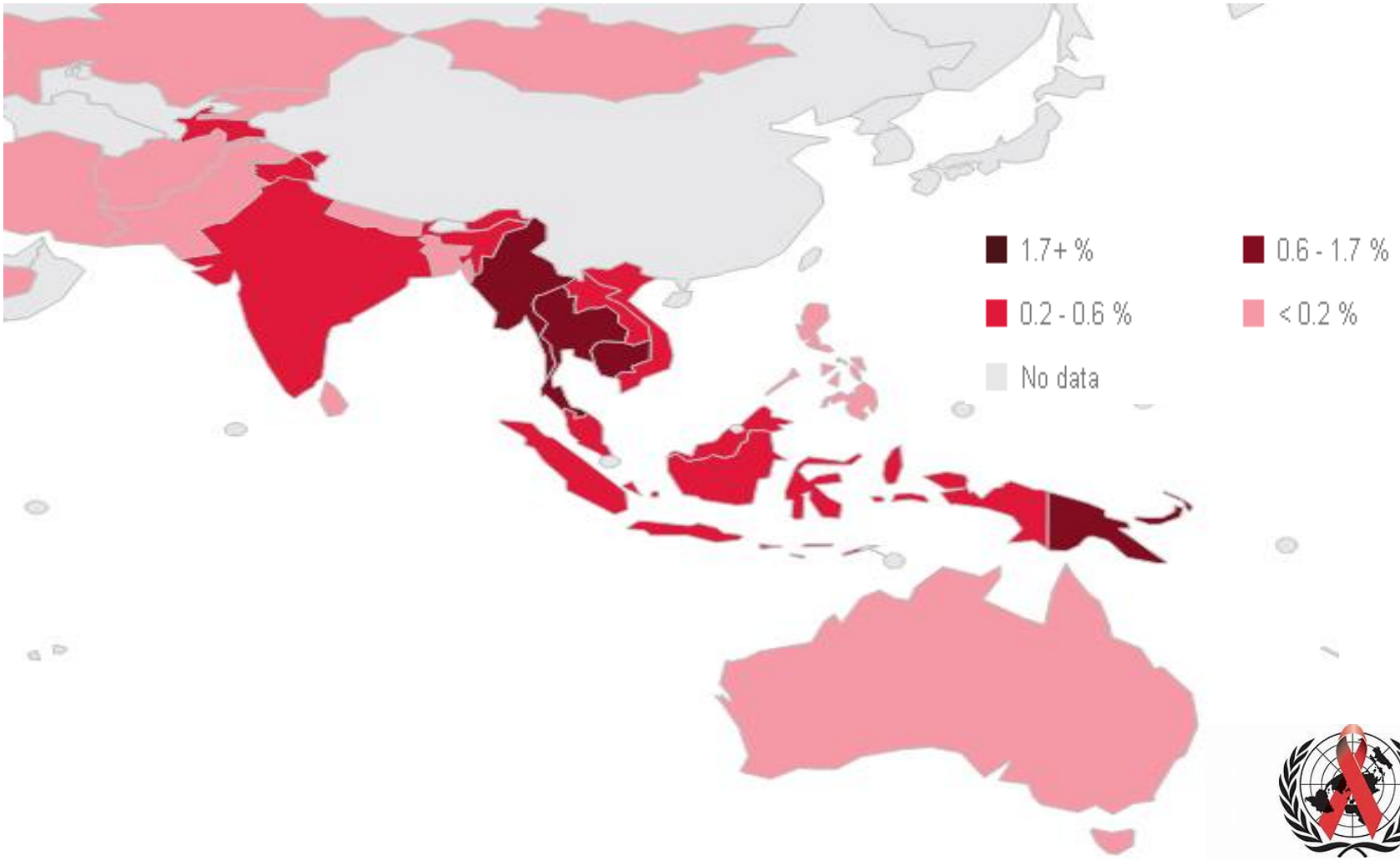
Source: UNAIDS Data 2017



10% of PLHIV globally in SEAR

Concentrated in India, Indonesia, Myanmar, Nepal and Thailand

Prevalence of HIV from 1990 – 2016: 15-49 year olds

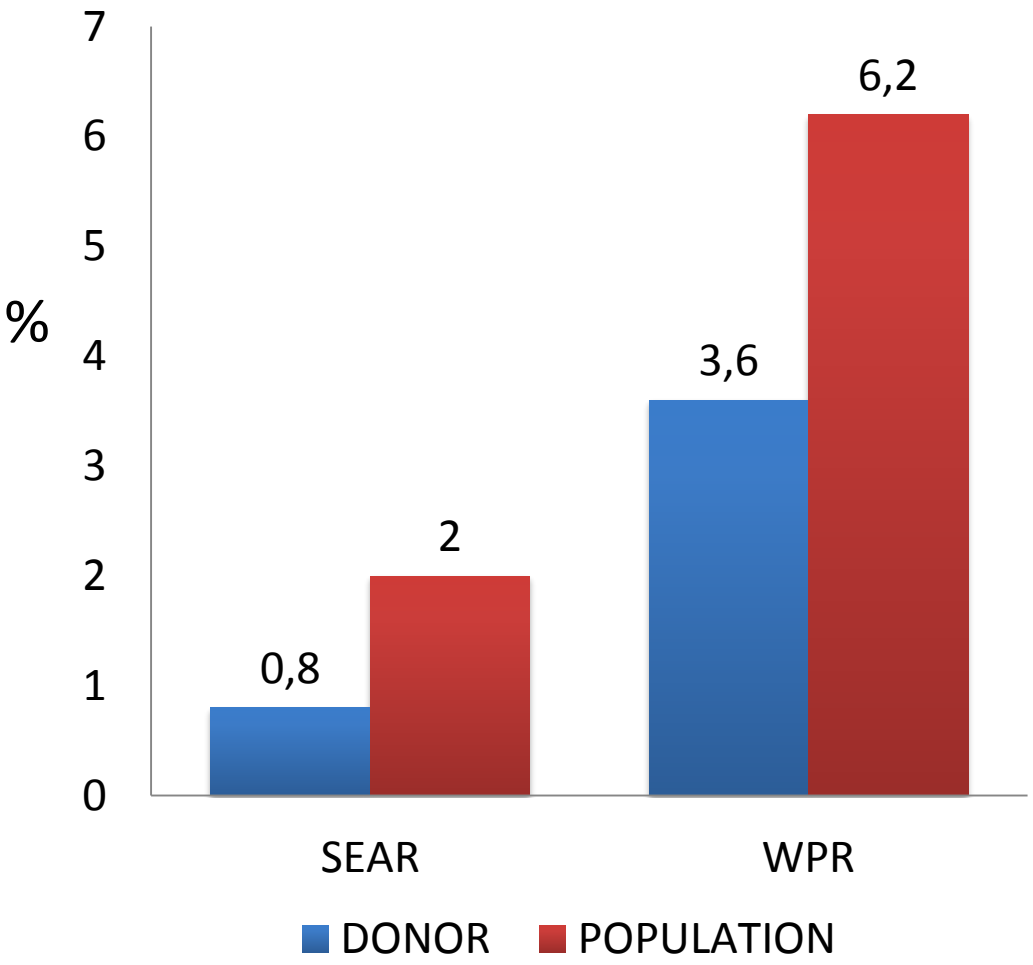


Joint United Nations Programme on HIV/AIDS

UNAIDS

UNHCR·UNICEF·WFP·UNDP·UNFPA
UNODC·ILO·UNESCO·WHO·WORLD BANK

PREVALENCE OF HEPATITS B AMONG POPULATION AND DONOR



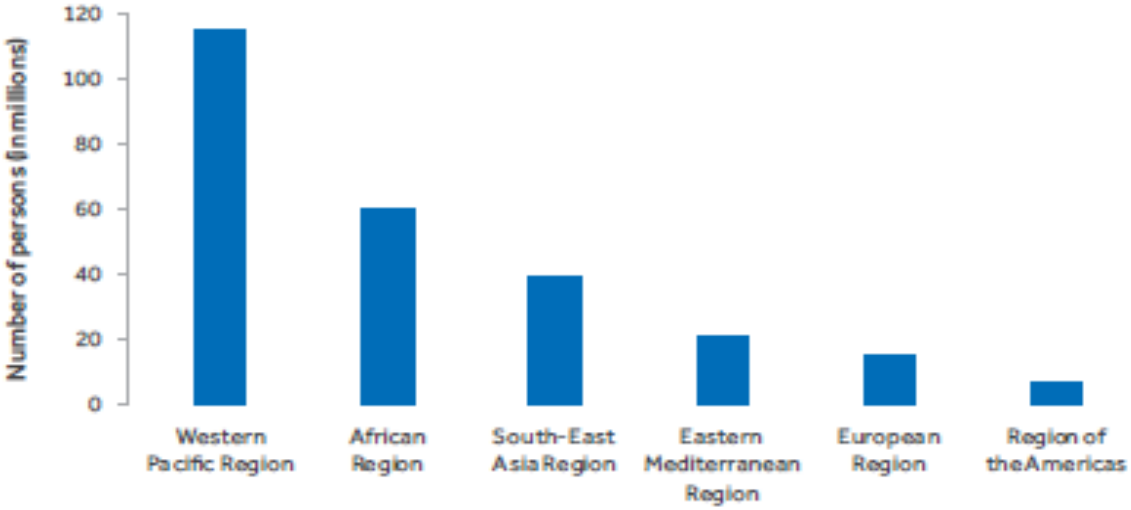
In 2015, the global prevalence of HBV infection in the general population was 3.5%

Overall, about 257 million persons were living with HBV infection

GLOBAL HEPATITIS REPORT 2017

WHO GLOBAL STATUS REPORT ON BLOOD SAFETY AND AVAILABILITY 2016

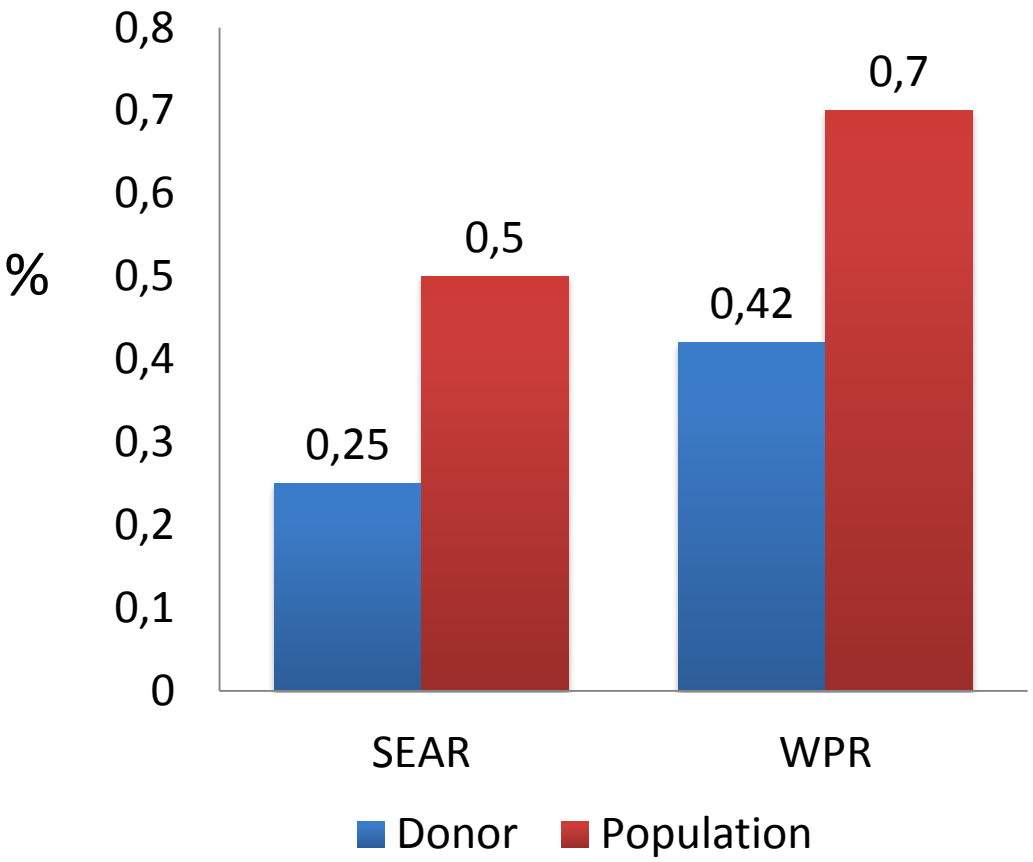
Table 2 (with graph). Prevalence of HBV infection (HBsAg) in the general population by WHO region, 2015: the WHO African and Western Pacific regions have the highest prevalence and the largest number of persons living with HBV



	Estimates of the prevalence of HBV infection (%)			Estimated number of persons living with HBV (millions)		
		Uncertainty interval (95%)			Uncertainty interval (95%)	
WHO region	**Best**	**Lower**	**Higher**	**Best**	**Lower**	**Higher**
African Region	6.1	4.6	8.5	60	45	84
Region of the Americas	0.7	0.4	1.6	7*	4	16
Eastern Mediterranean Region	3.3	2.6	4.3	21	17	28
European Region	1.6	1.2	2.6	15	11	23
South-East Asia Region	2.0	1.5	4.0	39	29	77
Western Pacific Region	6.2	5.1	7.6	115	93	140
Total	**3.5**	**2.7**	**5.0**	**257**	**199**	**368**

Source: WHO, work conducted by the London School of Hygiene & Tropical Medicine (LSHTM). *See Annex 2.*

PREVALENCE OF HEPATITIS C AMONG POPULATION AND DONOR



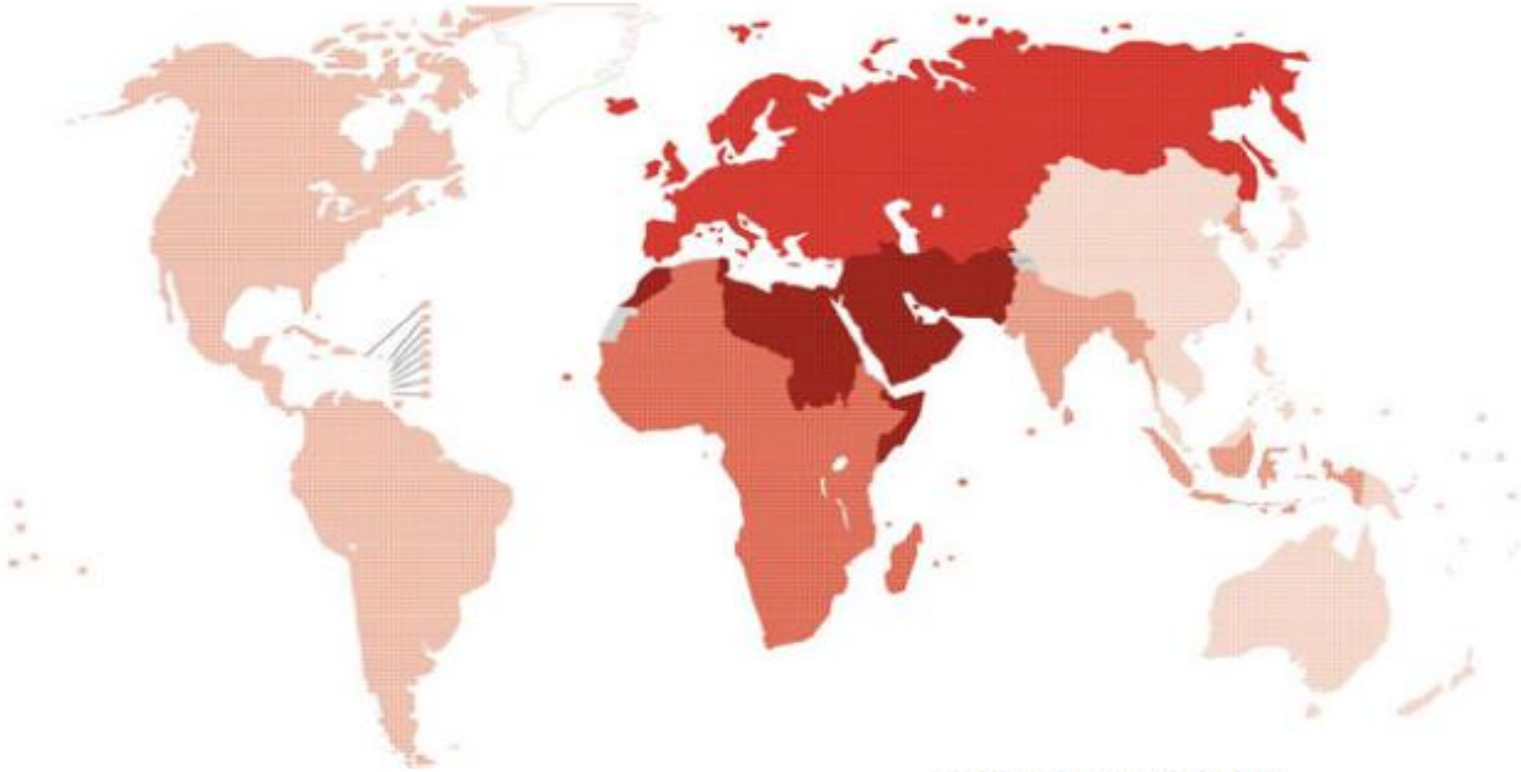
In 2015 global prevalence of HCV infection was 1.0%

71 million persons were living with chronic HCV infection

GLOBAL HEPATITIS REPORT 2017

WHO GLOBAL STATUS REPORT ON BLOOD SAFETY AND AVAILABILITY 2016

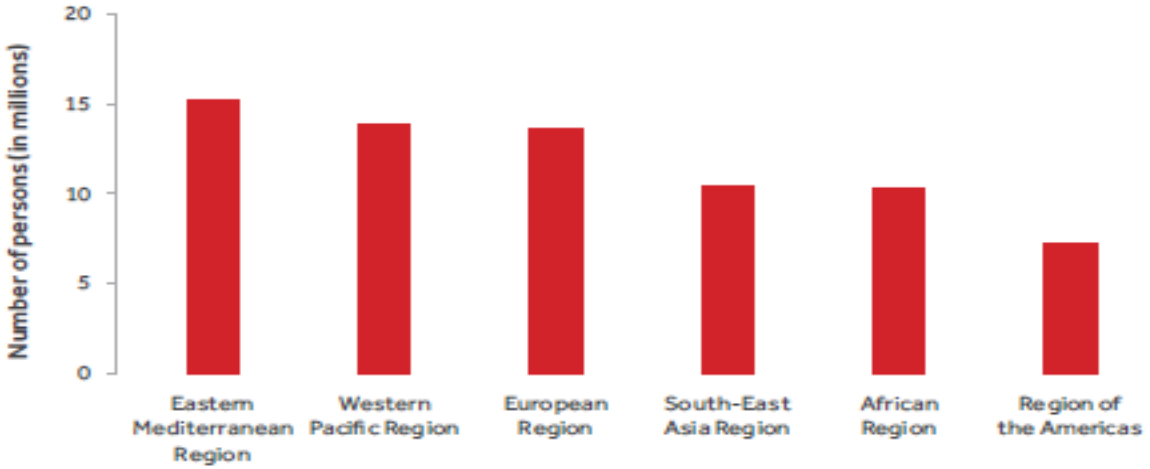
Table 3 (with map). Incidence of HCV infection in the general population, by WHO region, 2015: 1.75 million new infections in 2015



		Incidence of HCV infection			
		Incidence rate (per 100 000)		Total number (000)	
WHO region	Map key	Best estimate	Uncertainty interval	Best estimate	Uncertainty interval
African Region		31.0	22.5–54.4	309	222–544
Region of the Americas		6.4	5.9–7.0	63	59–69
Eastern Mediterranean Region		62.5	55.6–65.2	409	363–426
European Region		61.8	50.3–66.0	565	460–603
South-East Asia Region		14.8	12.5–26.9	287	243–524
Western Pacific Region		6.0	5.6–6.6	111	104–124
Global		**23.7**	**21.3–28.7**	**1 751**	**1 572–2 120**

Source: WHO, work conducted by the Center for Disease Analysis. See Annex 2.

Table 4 (with graph). Prevalence of HCV infection (HCV RNA positive) in the general population, by WHO region, with uncertainty intervals, 2015: 71 million persons living with HCV worldwide



	Estimates of the prevalence of HCV infection (%)			Estimated number of persons living with HCV (millions)		
		Uncertainty interval			Uncertainty interval	
WHO region	**Best**	**Lower**	**Higher**	**Best**	**Lower**	**Higher**
African Region	1.0	0.7	1.6	11	7	16
Region of the Americas	0.7	0.6	0.8	7	6	8
Eastern Mediterranean Region	2.3	1.9	2.4	15	13	15
European Region	1.5	1.2	1.5	14	11	14
South-East Asia Region	0.5	0.4	0.9	10	8	18
Western Pacific Region	0.7	0.6	0.8	14	10	15
Total	**1.0**	**0.8**	**1.1**	**71**	**62**	**79**

Source: WHO, work conducted by the Center for Disease Analysis. *See* Annex 2.

Prevalence of infection among blood donors in the SEAR & WPR

Prevalence (%) of TTI in SEAR

Countries	HIV	HBV	HCV	Syphilis
Bangladesh	0.01	0.87	0.10	0.10
Bhutan	0.07	0.94	0.16	0.60
Democratic People's Republic of Korea	n.a.	0.79	0.129	n.a.
India	0.20	1.00	0.40	0.20
Indonesia	0.22	1.63	0.40	0.83
Maldives	0.02	0.39	0.51	0.20
Myanmar	0.29	2.42	0.50	0.80
Nepal	0.05	0.29	0.23	0.37
Sri Lanka	0.004	0.07	0.25	0.047
Thailand	0.08	0.35084	0.09	0.13
Timor-Leste	0.01	0.06	0.001	0.01

Prevalence (%) of TTI in WPR

Countries	HIV	HBV	HCV	Syphilis
Australia	0.00046	0.00798	0.00511	0.00023
Brunei Darussalam	0.02	0.36	0.11	0.47
Cambodia	0.18	5.75	0.67	0.72
China	0.14	0.73	0.42	0.59
Fiji	0.10	2.00	n.a.	1.60
Japan	0.07	0.57	0.03	0.09
Kiribati	0	9.78	0	3.06
Lao People's Democratic Republic	0.09	4.41	0.18	0.003
Malaysia	0.03	0.25	0.06	0.06
Marshall Islands	0	0.07	0	0.05
Micronesia (Federated States of)	0	1.18	0.36	2.19

Prevalence of TTI in WPR

Countries	HIV	HBV	HCV	Syphilis
Mongolia	0.004	4.30	3.00	3.10
New Zealand	0	0.013	0.003	0.004
Papua New Guinea	1.32	13.49	n.a.	12.41
Philippines	0.05	1.20	0.06	0.17
Republic of Korea	0.12	0.06	0.09	0.07
Samoa	0	4.58	0.89	0.09
Singapore	0.005	0.0857	0.01648	0.02884
Solomon Islands	0.43	16.3	1.71	7.27
Tuvalu	0	8.82	0	0.98
Viet Nam	0.045	2.2	0.31	0.12

TTI Prevalence among blood donors

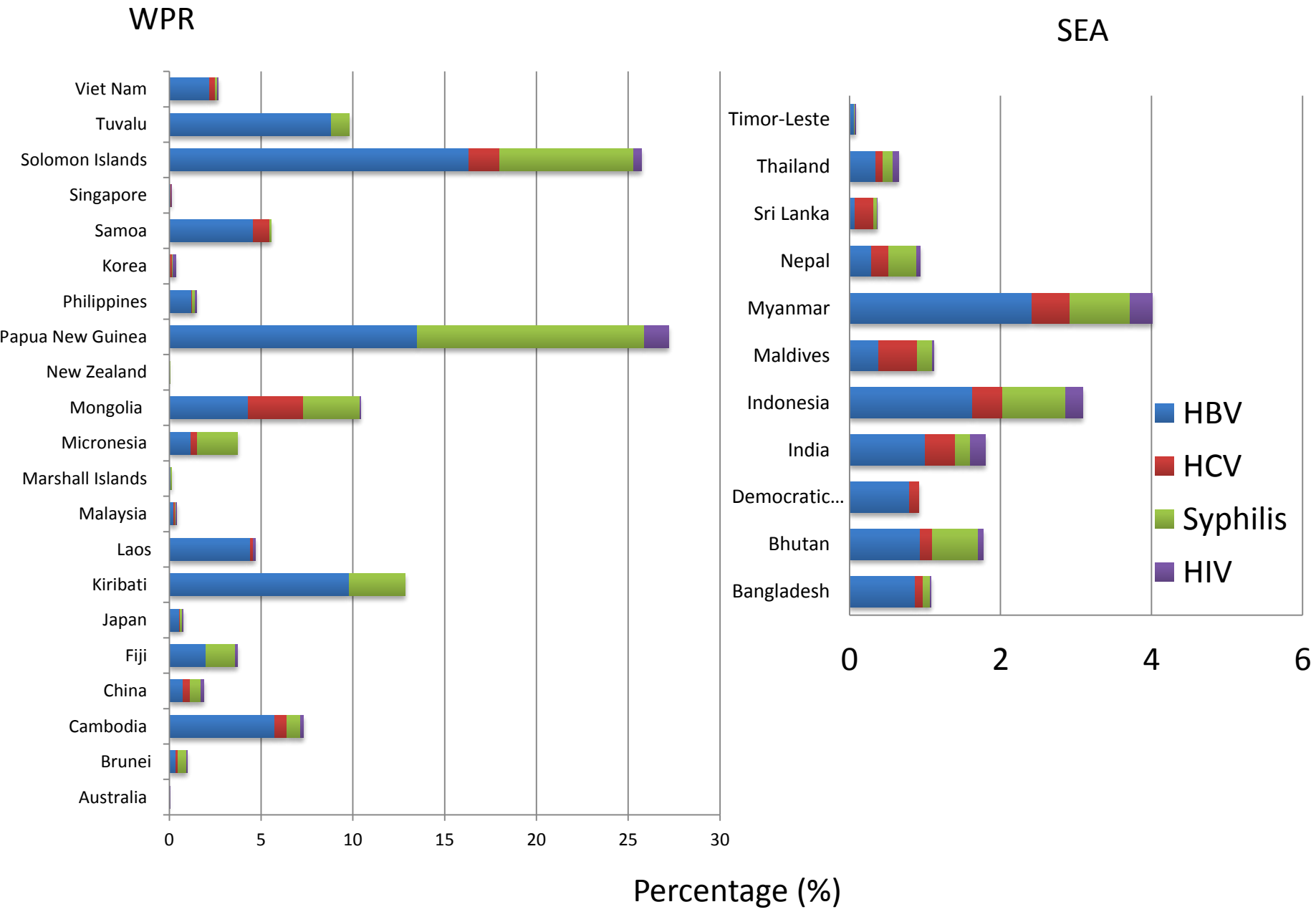


Table 15. Proportions of blood donations with positive/reactive results on screening tests by World Bank income group

Income group	Proportion of blood donations with positive/reactive results (median and interquartile range, %)			
	HIV	HBV	HCV	Syphilis
High	0.003 (<0.001–0.04)	0.03 (0.008–0.18)	0.02 (0.003–0.16)	0.05 (0.005–0.26)
Upper middle	0.08 (0.006–0.2)	0.39 (0.16–0.69)	0.21 (0.05–0.42)	0.31 (0.12–1.07)
Lower middle	0.20 (0.05–0.44)	1.60 (0.94–4.13)	0.40 (0.19–1.50)	0.58 (0.18–1.47)
Low	1.08 (0.56–2.69)	3.70 (3.34–8.47)	1.03 (0.67–1.80)	0.90 (0.31–1.88)

- Globally, the proportions vary greatly, with the lowest proportions in developed countries and the highest in developing countries for all infections.

DONATION SCREENING FOR HBV/HCV/HIV/SYPHILIS (SEAR & WPR)

Distribution of blood laboratory screening policies for HIV-1/2 by WHO region

Region	Ab	Ab+Ag	Ab + NAT	Ab+Ag + NAT	Unanswered
Africa (n=46)	11	33	2	0	0
Americas (n=35)	5	22	3	2	3
Eastern Mediterranean (n=20)	3	11	2	3	1
Europe (n=43)	4	16	16	7	0
South-East Asia (n=11)	6	3	0	2	0
Western Pacific (n=25)	12	6	6	1	0
Global (n=180)	41	91	29	15	4

Table 7. Distribution of blood laboratory screening policies for HBV by WHO region

Region	HBsAg	HBsAg + anti-HBc (routine)	HBsAg + anti-HBc (selective)	HBsAg + anti-HBc (routine) + NAT	HBsAg + anti-HBc (selective) + NAT	HBsAg + NAT	Unanswered
Africa (n=46)	36	6	2	0	0	2	0
Americas (n=35)	16	12	0	3	0	1	3
Eastern Mediterranean (n=20)	7	7	0	4	1	0	1
Europe (n=43)	14	4	3	5	5	12	0
South-East Asia (n=11)	8	1	0	0	1	1	0
Western Pacific (n=25)	17	1	0	1	1	5	0
Global (n=180)	98	31	5	13	8	21	4

Distribution of blood laboratory screening policies for HCV by WHO region

Region	Anti-HCV	Anti-HCV Ab+Ag	HCV Ab + NAT	HCV Ab+Ag + NAT	No test	Unanswered
Africa (n=46)	31	13	2	0	0	0
Americas (n=35)	21	6	3	1	0	4
Eastern Mediterranean (n=20)	10	4	4	1	0	1
Europe (n=43)	15	5	21	2	0	0
South-East Asia (n=11)	8	1	2	0	0	0
Western Pacific (n=25)	16	1	7	0	1	0
Global (n=180)	101	30	39	4	1	5

- All countries in SEAR and WP screened for syphilis

Table 9. Testing for Chagas disease

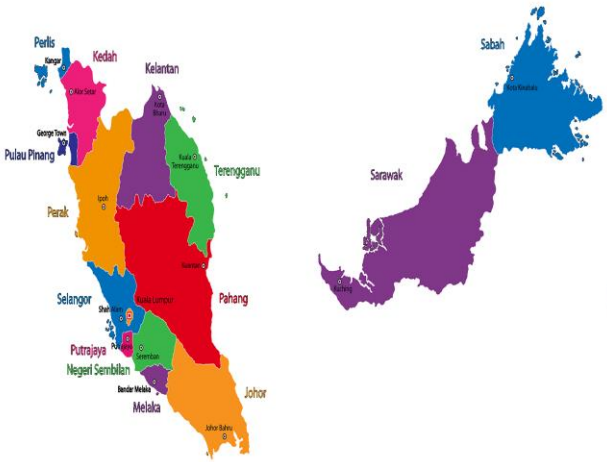
Test for all donations	Selective testing
Argentina	Belgium
Belize	Canada
Bolivia (Plurinational State of)	France
Brazil	Japan
Chile	Luxembourg
Colombia	New Zealand
Costa Rica	Norway
El Salvador	Spain
Guatemala	Sweden
Guyana	Switzerland
Honduras	United Kingdom
Mexico	United States of America
Panama	
Paraguay	
Suriname	
Trinidad and Tobago	
Uruguay	
Venezuela (Bolivarian Republic of)	

selective testing for *T. cruzi* for donors who have travelled to at-risk areas or who have defined risk factors

Testing for HTLV- I/II

- SEAR: no screening done
- Western Pacific Region: selective screening done in Australia, Japan, New Zealand, Republic of Korea

MALAYSIA/ CENTRAL REGIONAL BLOOD CENTRE DONOR EPIDEMIOLOGY



Population
31,633,500

(2016) Department of statistics, Malaysia

Blood donors
693,608

68.09%
Regular
donors

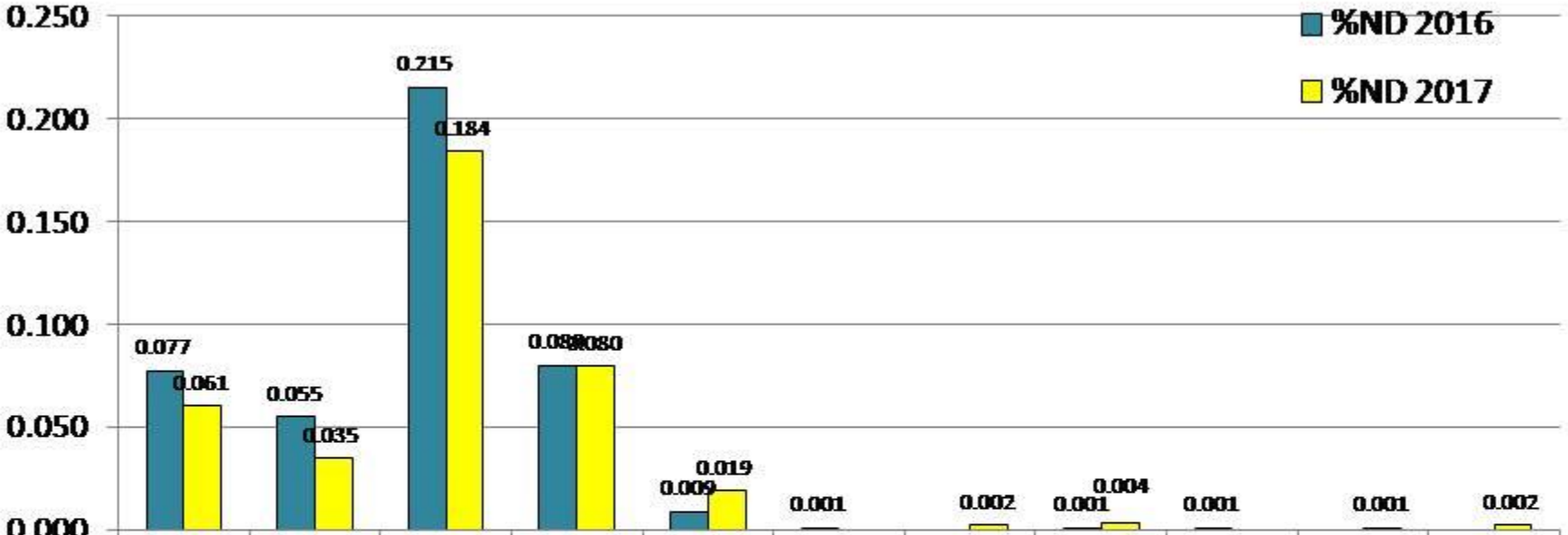
99.9%
Voluntary
donors

Males:
65.61%
Females:
34.39%

Mobile
operation
collect
79.01%

Annual report blood transfusion services 2016

% OF POSITIVE CASE(PREVALANCE) FOR NEW DONOR 2016 & 2017

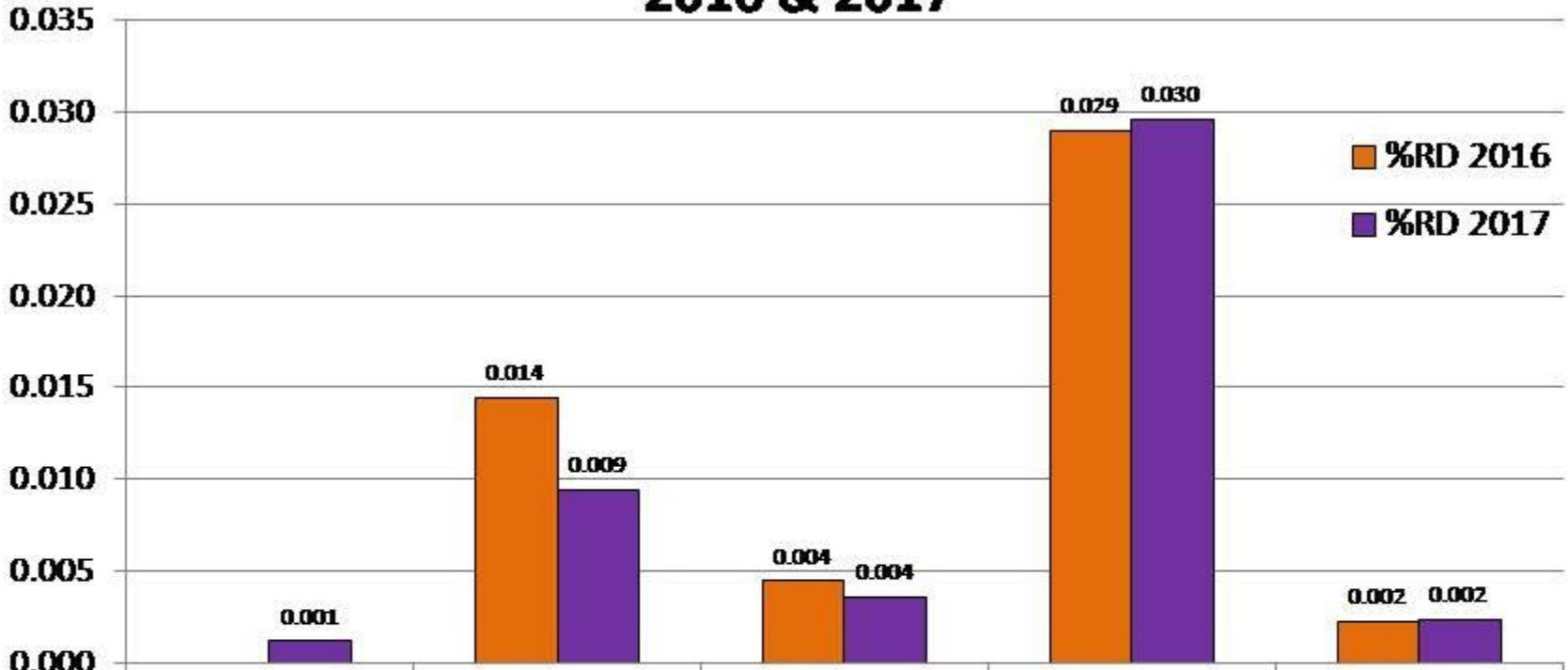


	HCV	HIV	HBV	SYPHILIS	HIV,SYPH	HBV,SYPH	HCV,SYPH	HBV,HIV	HBV,HCV	HBV, HIV & SYPH	HCV, HIV & SYPH
%ND 2016	0.077	0.055	0.215	0.080	0.009	0.001	0.000	0.001	0.001	0.000	0.000
%ND 2017	0.061	0.035	0.184	0.080	0.019	0.000	0.002	0.004	0.000	0.001	0.002

Year	2016	2017
Total new donor	76160	82619
% Positive cases	0.44%	0.39%

Data was obtained from Donor Management, PDN

% OF POSITIVE CASE (PREVALANCE) FOR REGULAR DONOR 2016 & 2017

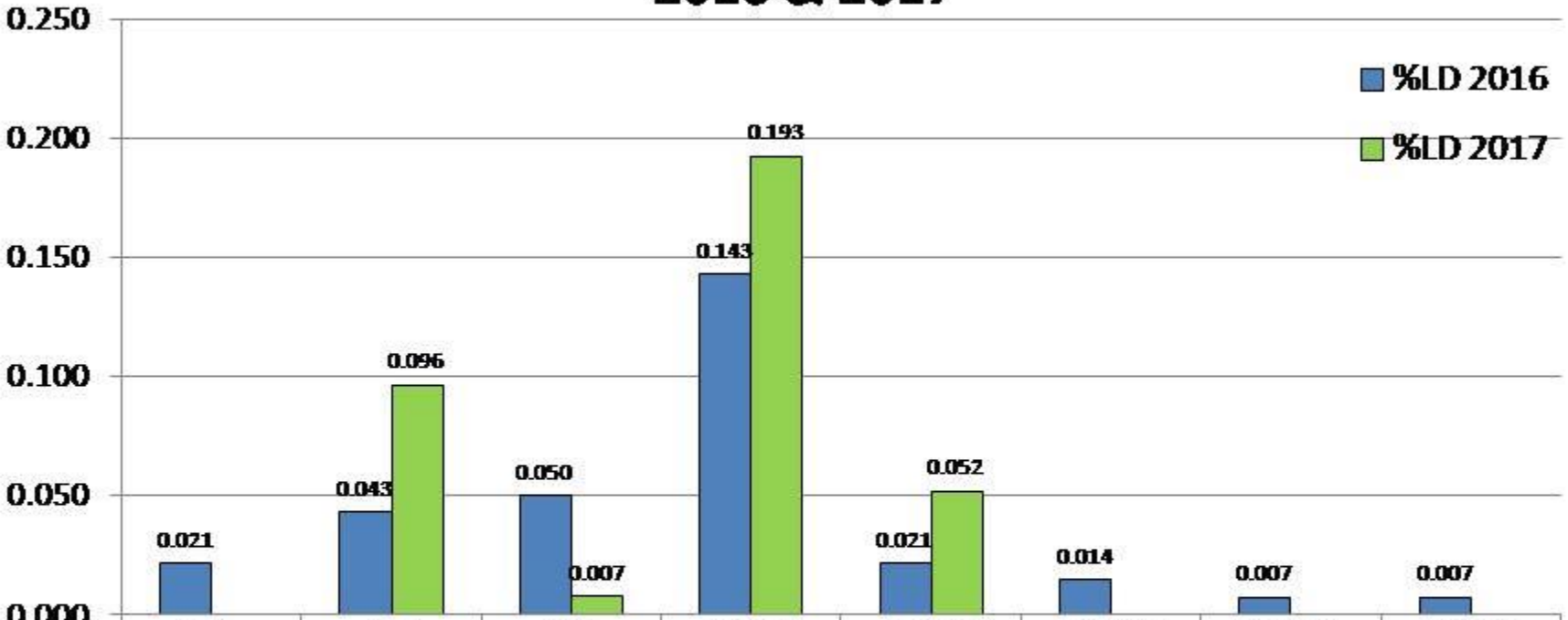


	HCV	HIV	HBV	SYPHILIS	HIV,SYPH
%RD 2016	0.000	0.014	0.004	0.029	0.002
%RD 2017	0.001	0.009	0.004	0.030	0.002

Year	2016	2017
Total regular donor	89792	84526
% Positive cases	0.05%	0.05%

Data was obtained from Donor Management, PDN

% OF POSITIVE(PREVALENCE) CASE FOR LAPSED DONOR 2016 & 2017



	HCV	HIV	HBV	SYPHILIS	HIV,SYPH	HBV,SYPH	SYPH, OBI	HBV,HIV
%LD 2016	0.021	0.043	0.050	0.143	0.021	0.014	0.007	0.007
%LD 2017	0.000	0.096	0.007	0.193	0.052	0.000	0.000	0.000

Year	2016	2017
Total lapsed donor	13994	13505
% Positive cases	0.31%	0.35%

Data was obtained from Donor Management, PDN

BLOOD SAFETY

HBV , HCV & HIV infections of ID-NAT screening of 1,971,033 donations (Central Region : NBCKL and Districts from 2008 to 2016)

RESIDUAL TRANSMISSION RISK

HIV — **1.97 per million donations @ 1 in 507,042 donations**

HBV — **5.26 per million donation @ 1 in 190,207 donations**

HCV — **0.15 per million donations @1 in 6,573,188 donations**

NBCKL unpublished data

Conclusion

- significant variations in the safety between developed and developing countries.
- safety is still a concern, especially in low- and middle-income countries, where the prevalence of transfusion-transmissible infections among blood donors is high but quality and coverage of blood screening is inadequate

- low- and middle- income countries still lack enough voluntary unpaid blood donors, with low blood donation rates
- More effort is therefore still required to strengthen national blood systems so as to ensure sufficient and safe blood supplies worldwide, especially in low- and middle-income countries.
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Acknowledgement

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- Tn Hj Mohd Azam, TML PDN