



**CONFERENCIA  
PANAMERICANA  
SOBRE DIABETES  
Y EMBARAZO**

**SEPT  
8 | 10  
2015  
LIMA  
PERU**

**PAN AMERICAN  
CONFERENCE  
ON DIABETES &  
PREGNANCY**

## Introduction. Diabetes & Pregnancy

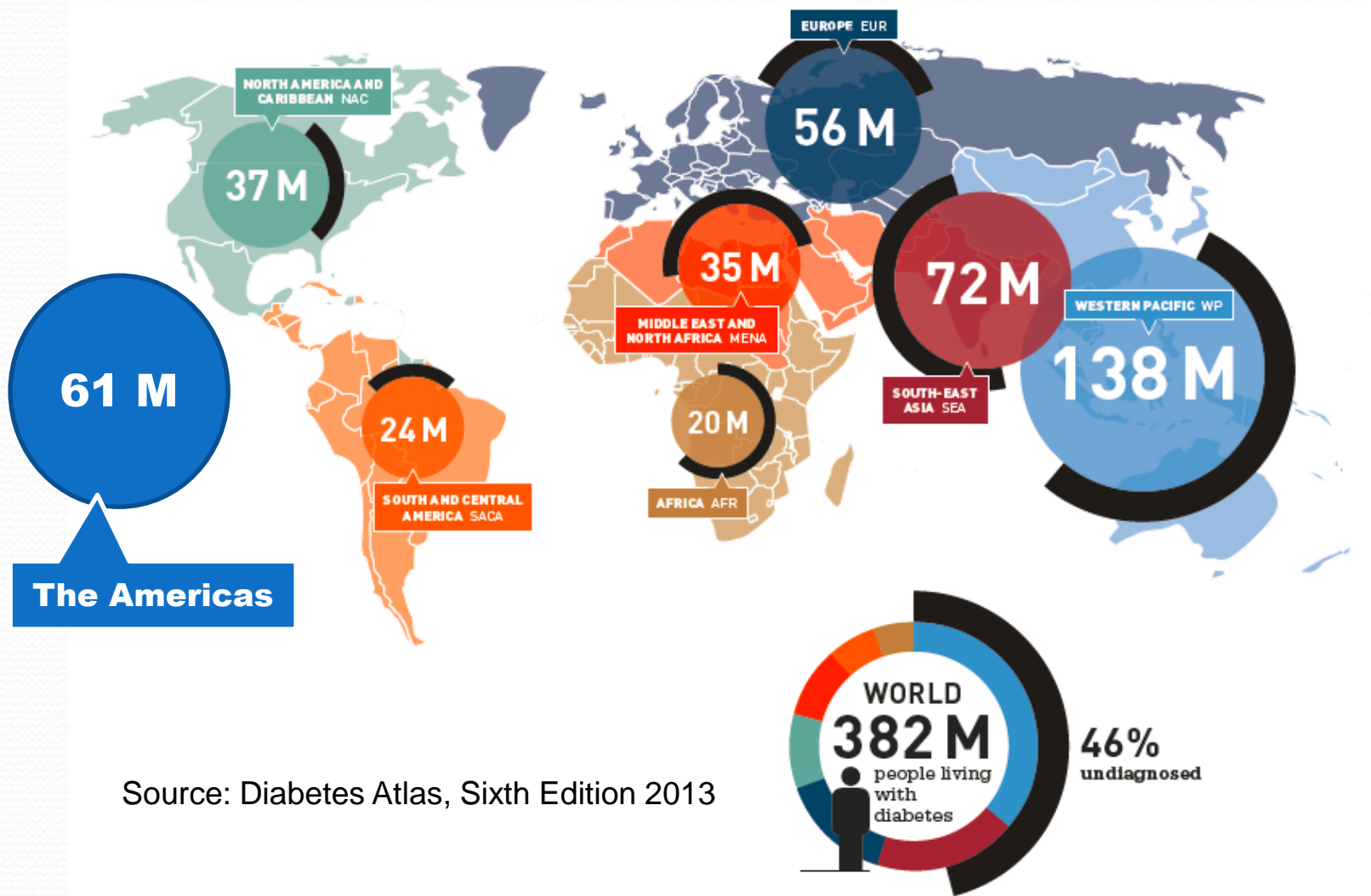
### Presenter:

**Alberto Barceló, MD, MSc**  
**Regional Advisor**  
**Pan American Health Organization**  
**World Health Organization**  
**Washington DC**

# Outline

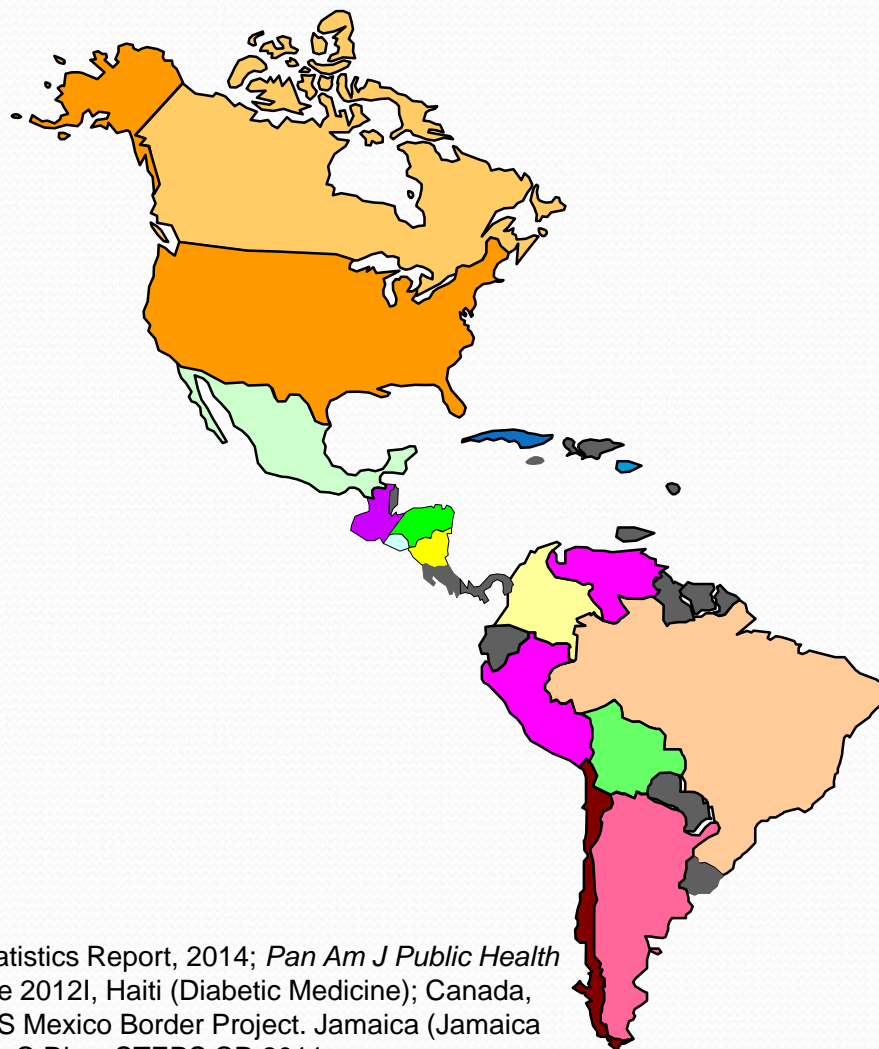
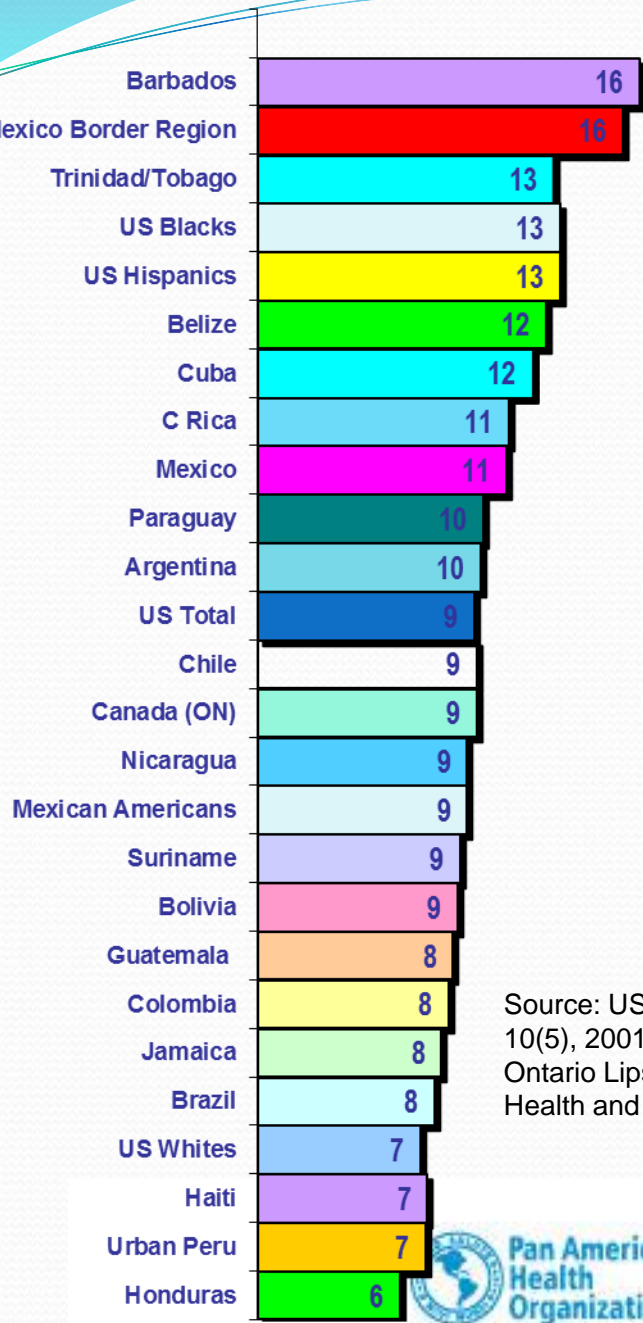
1. Conference introduction:
  - Aim,
  - Participant countries,
  - Session description
  - Working groups
  - Social media and webcast
2. The prevalence of diabetes in the Americas
3. Gestational Diabetes in the Americas: data from participating countries

# Diabetes in the World



Source: Diabetes Atlas, Sixth Edition 2013

# Prevalence (%) of diabetes among adults in the Americas



Source: US: National Diabetes Statistics Report, 2014; *Pan Am J Public Health* 10(5), 2001; Barceló Diabetes Care 2012I, Haiti (Diabetic Medicine); Canada, Ontario Lipscombe & Hux 2007; US Mexico Border Project. Jamaica (Jamaica Health and Lifestyle Survey, 2008); C Rica, STEPS CR 2011

# Diabetes & Pregnancy

## AT A GLANCE

2013

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Total live births (20-49 years, millions)

127.1

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### HYPERGLYCAEMIA IN PREGNANCY IN WOMEN (20-49 YEARS)

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Global prevalence (%)

16.9

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Comparative prevalence (%)

14.8

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Number of live births with hyperglycaemia in pregnancy (millions)

21.4

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Proportion of cases that may be due to diabetes in pregnancy (%)

16.0

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Source: Diabetes Atlas, Sixth Edition 2013

**Table 2.5 Hyperglycaemia in pregnancy (20-49 years) by IDF Region, 2013**

<b>IDF REGION</b>	Cases in live births <b>MILLIONS</b>	Prevalence* <b>%</b>	Proportion of cases that may be due to diabetes in pregnancy <b>%</b>
AFR	4.6	14.4	19.6
EUR	1.7	12.6	10.9
MENA	3.4	17.5	17.7
NAC	0.9	10.4	24.9
SACA	0.9	11.4	17.3
SEA	6.3	25.0	9.5
WP	3.7	11.9	14.1

\*comparative prevalence



**91.6% of cases of hyperglycaemia in pregnancy are estimated to occur in low- and middle-income countries, where access to maternal care is often limited**

**Obesity and diabetes affect women disproportionately. Gestational diabetes in particular has detrimental consequences for mother and child, increasing the frequency of perinatal morbidity and mortality. In addition, maternal obesity and diabetes have been linked to increased susceptibility for the child to develop diabetes during youth, creating a vicious circle where obesity and diabetes beget more diabetes.**

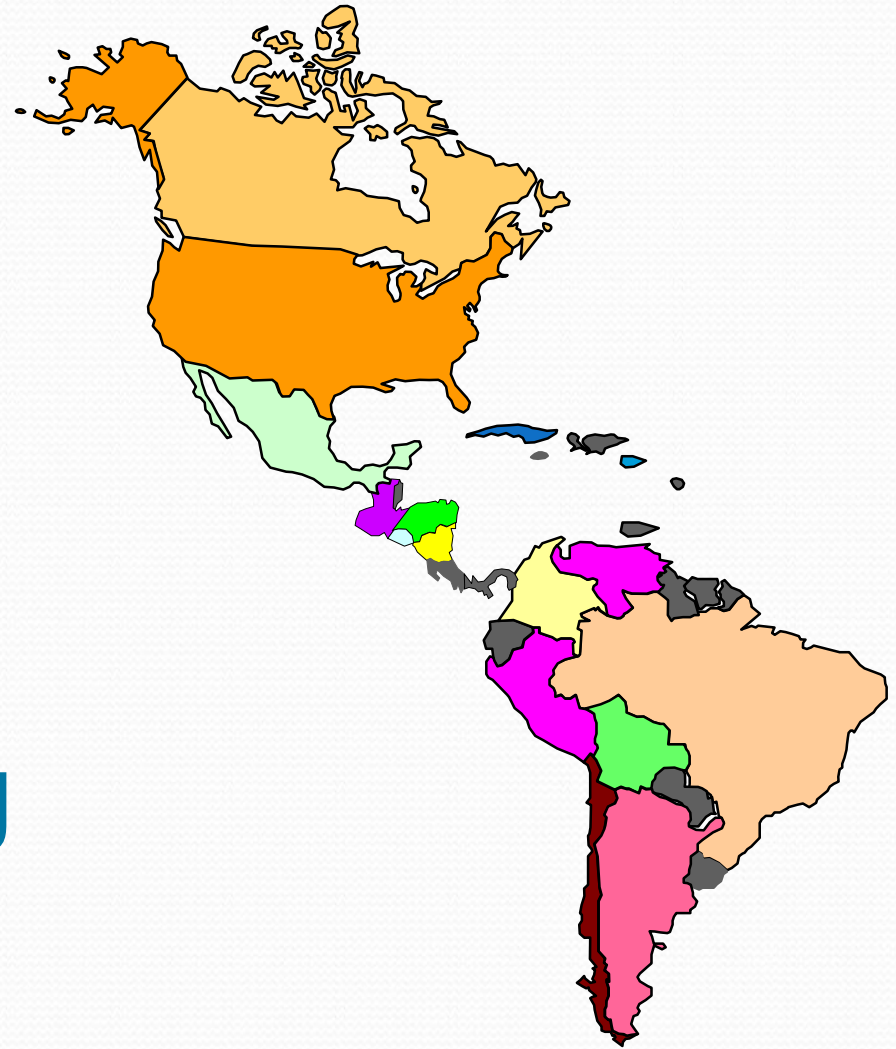






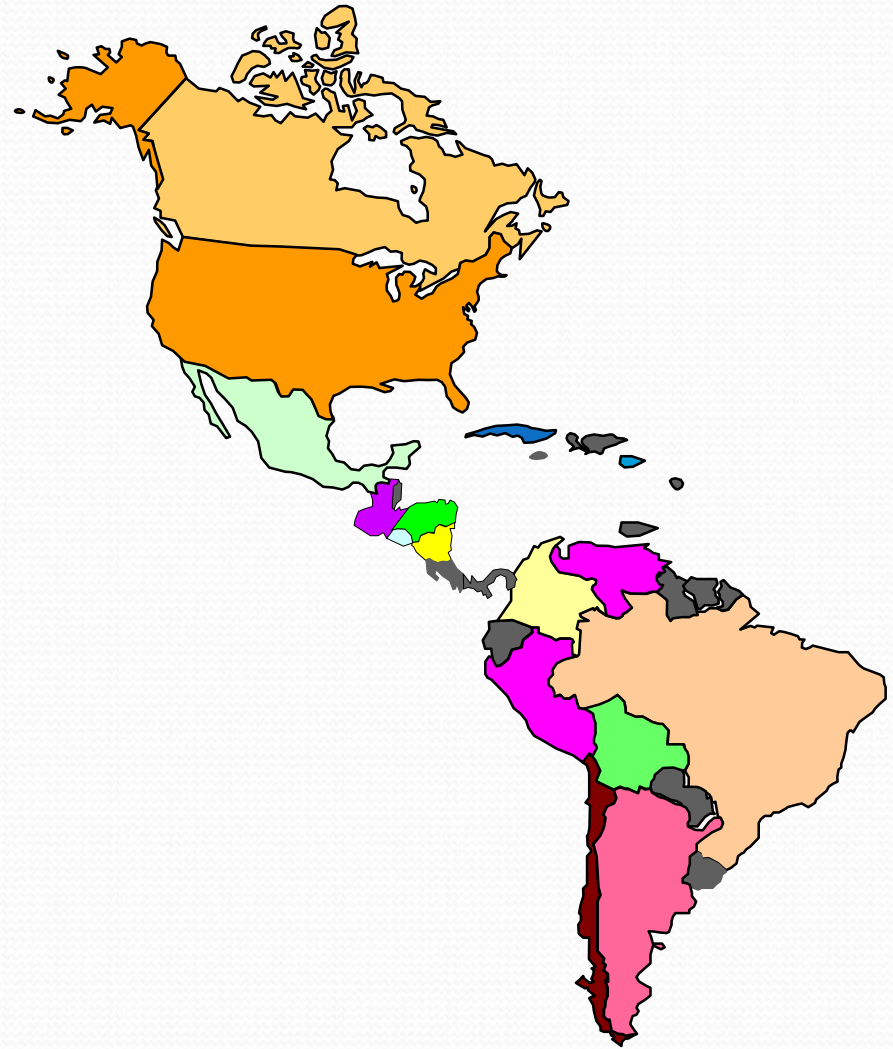
## Aim

**To provide scientific information, and review evidence-based guidelines on improving the prevention and control of diabetes related to pregnancy in the Americas.**



# Participating Countries

1. Antigua & Barbuda
2. Argentina
3. Barbados
4. Bolivia
5. Belize
6. Brazil
7. Canada
8. Chile
9. Colombia
10. Costa Rica
11. Cuba
12. Dominica
13. Dominican Republic
14. Ecuador
15. El Salvador
16. Guatemala
17. Guyana
18. Honduras
19. Jamaica
20. Mexico
21. Nicaragua
22. Panama
23. Paraguay
24. Peru
25. Puerto Rico
26. St. Kitts & Nevis
27. St. Lucia
28. Suriname
29. Trinidad & Tobago
30. United States
31. Venezuela



# DM/GDM Programs by Country, 2015

Country	Level of implementation of diabetes prevention program	Level of implementation of GDM program	Level of implementation of educational T2D program	Level of implementation of GDM educational program
Argentina			Institutional	Institutional
Barbados	None	None	Institutional	None
Barbados	National	None	National	None
Belize	Institutional	None	National	Institutional
Canada	National	National	National	National
Chile	National	None	None	None
Cuba	National	Institutional	National	Institutional
Dominica	National	None	National	None
El Salvador	National	None	National	None
Guatemala	None	None	None	None
Guyana		None	National	None
Honduras	None	None	None	None
Jamaica	National	None	National	None
Mexico				
Panama	None	None	Institutional	Institutional
Paraguay	National	Institutional	National	Institutional
Peru	National	Regional	National	
Puerto Rico	National	None	National	None
St.Kitts				
Suriname	National	National	None	None
Trinidad&Tobago	None	None	None	None
United States	National	None	National	None

## Number of LB, LGa, SGA by country

Country	Year of data collection	Number of live births	LGA	%	SGA	%	Scope
<b>Peru</b>	2014	629	55	8.74	16	2.54	Institutional
<b>Jamaica</b>							
<b>Belize</b>	2014	7244	1370	18.91	913	12.60	Regional
<b>Panama</b>	2014	14275	312	2.19	361	2.53	
<b>Chile</b>	2013	242005	24580	10.16	24659	10.19	National
<b>Argentina</b>	2014	754603	53350	7.07	55841	7.40	National
<b>Mexico</b>							
<b>Puerto Rico</b>	2013	36580	2567	7.02	928	2.54	National
<b>El Salvador</b>	2014	83530	1126	1.35	5010	6.00	Institutional
<b>Paraguay</b>	2013	106946					
<b>St.Kitts</b>	2014	527					
<b>Barbados</b>	2014	1100	89	8.09	217	19.73	Institutional
<b>Dominic</b>	2014	867			66	7.61	National
<b>Trinidad &amp; Tobago</b>	2014	4200					Institutional
<b>Canada</b>	2010	237718	23919	10.06	19097	8.03	National
<b>Guatemala</b>	2014	387342			46093	11.90	Institutional
<b>Guyana</b>	2013	5785	176	3.04	737	12.74	Institutional
<b>Cuba</b>	2014	122643	15	0.01	5	0.00	National
<b>United States</b>	2013	3932181					National
<b>Honduras</b>	2014	206656					National
<b>Suriname</b>							
<b>Total</b>		<b>6144831</b>	<b>107559</b>	<b>7.00</b>	<b>153943</b>	<b>8.00</b>	

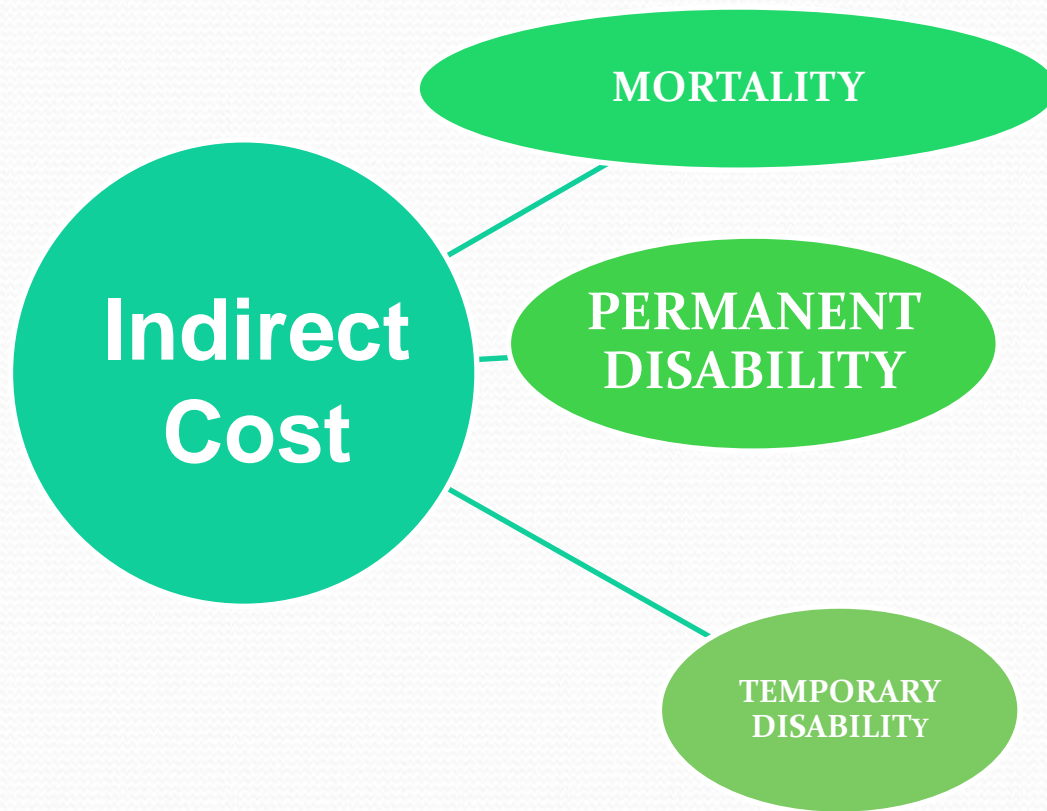
# Diagnostic value for hyperglycemia /GDM in the Americas

Country	Year	Fasting	Test	Casual	Load	1-H	2-H	3-H
Brazil*	2012	110 mg/dl	2		75 g		140mg/dl	
CDA*	2013	92 mg/dl	2		75 g	180mg/dl	153mg/dl	
Caribbean	2014				50 g		140mg/dl	
Chile	2014	100-125mg/dl	2		75 g		140mg/dl	
Costa Rica*	2007	95 mg/dl	2	200mg/dl	100 g	180mg/dl	155mg/dl	140mg/dl
Cuba	2013	100 mg/dl			75g		140mg/dl	
Nicaragua	2011	92 mg/dl	2		?	180mg/dl	153mg/dl	
Panama*	2009				50 g		140mg/dl	
Paraguay	2009	105 mg/dl			75 g		140mg/dl	
US-ADA	2010	92 mg/dl			75 g		153mg/dl	
USCPS*	2014				75g	135mg/dl	140mg/dl	
US-NDDG	1979	105 mg/dl	2			190mg/dl	165mg/dl	165mg/dl
Uruguay	2010	100 mg/dl	2		75g		140mg/dl	
ALAD	2008	105 mg/dl			50 g		140mg/dl	
WHO	2013	92 mg/dl			75 g		153mg/dl	

\*Two (or more) step diagnose/ Source: DM/GDM guidelines

# Diagnostic Criteria and Cut off value of Blood Glucose for Diabetes during Pregnancy, the Americas 2015

Country	Year	Number of diagnostic steps	Glucose load of glucose tolerance test	Fasting glucose	1 hour glucose	2 hour glucose	3 hour glucose
				(mg/dl)	(mg/dl)	(mg/dl)	(mg/dl)
Brazil	2012	2	75	110		140	
Costa Rica	2007	2	100	95	180	155	140
Nicaragua	2011	2		92	180	153	
Panama	2009		50			140	
Uruguay	2010	2	75	100		140	
Peru	2011	2	75	92	180	153	
Jamaica	2008	2	100	95	180	155	140
Belize	2011	3	100	105	180	155	140
Panama	2009	2	75	126	180	155	140
Chile	2014	3	75	100-125		140	
Argentina	2013	2	75	100		140	
Mexico							
Puerto Rico	2015	2	100	95	180	155	140
El Salvador	2014	2	100	200	180	155	140
Paraguay	2008	2	105	105		140	
St.Kitts					190		
Barbados	2006	3	100	95	180	155	140
Dominica, West Indies	2011	3	75	120	180	155	140
Trinidad & Tobago							
Canada	2013	2		200	191	162	
Guatemala	2015	2	75	92	180	153	
Guyana	2013	1	75	92	180	155	999
Cuba	2013	1	75	100		140	
United States	2013/2015	2	100		180 or 190	155 or 165	140 or 145
Honduras			100	126	180	155	140
Suriname	2012	2					
WHO	2013	2	75	92		153	



$$PAF = P(RR-1)/1+(P(RR-1))$$

YPLL

GDP

Discounted Future Earnings

Permanent disabled:

- amputations,
- terminal renal disease, blindness,
- cerebrovascular diseases
- infarction

Lost productive days

50% economically active

Number of lost days of work from the ViCent Survey



## Estimated indirect cost of diabetes in Latin America & the Caribbean, 2014

Item	Estimate
Populations 20-79 (X10 <sup>3</sup> )	385,446
W/diabetes (X10 <sup>3</sup> )	34,254
<b>Mortality</b>	
No. of deaths	1,386,513
R/diabetes (40-65 years)	374,920
YPLL	1,960,339
Cost (US\$X10 <sup>6</sup> )	\$16,934
<b>Permanent Disability</b>	
w/permanently disability	902,879
YPLL	8,616,334
Cost (US\$X10 <sup>6</sup> )	\$72,657
Cost in 1 year (US\$X10 <sup>6</sup> )	\$8,823
<b>Temporary Disability</b>	
w/ temporary disability	25,753,121
YPLL	296,134
Cost (US\$X10 <sup>6</sup> )	\$2,978
<b>Indirect Cost (US\$X10<sup>6</sup>)</b>	<b>\$28,735</b>



# Direct Cost



Medication  
Insulin  
HOA

Emergency  
Visits

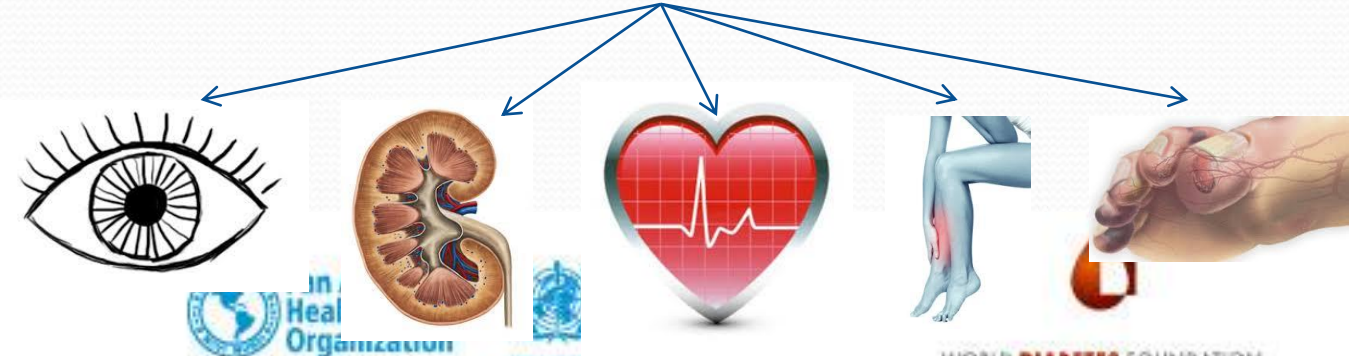


Consultations

Hospitalizations



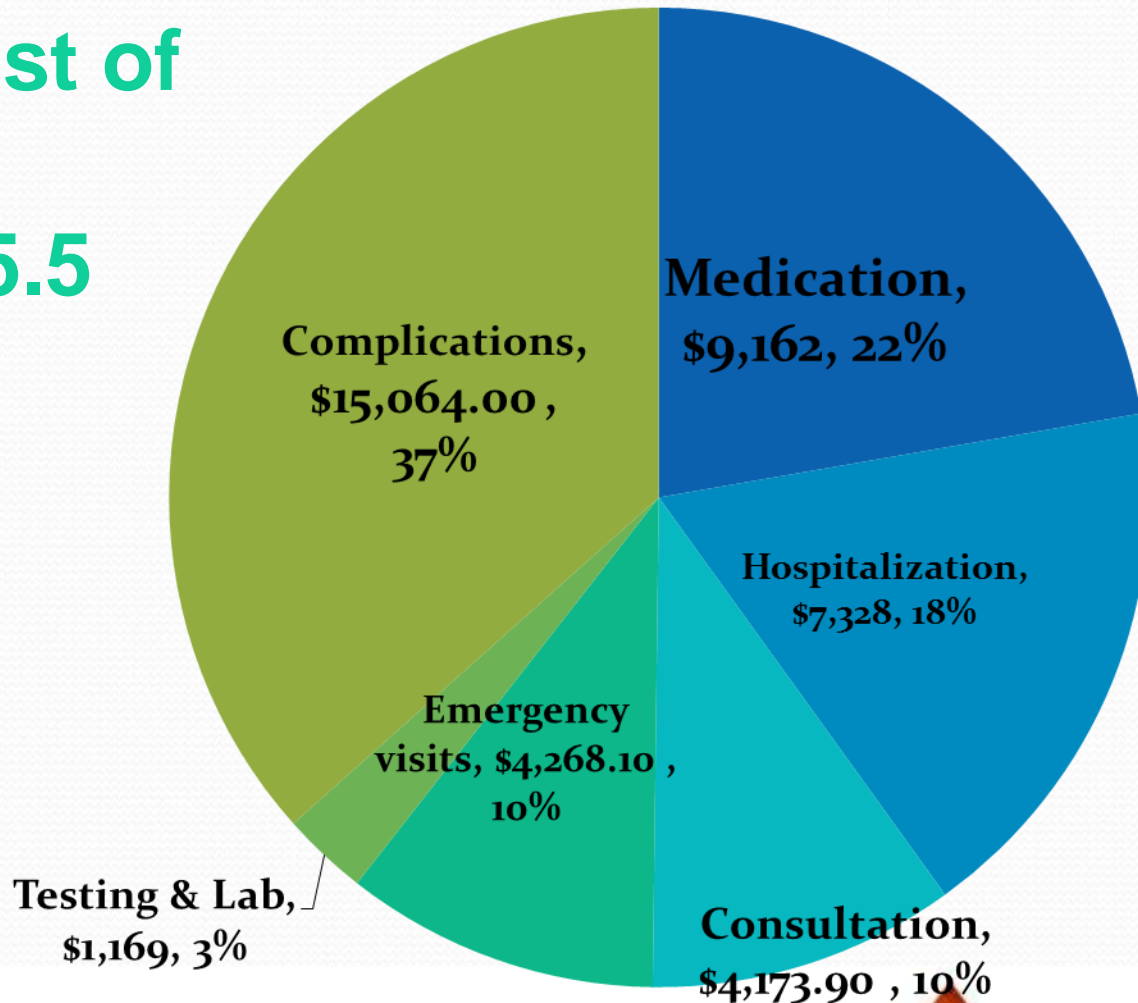
Excess Cost  
Caused by  
Complications



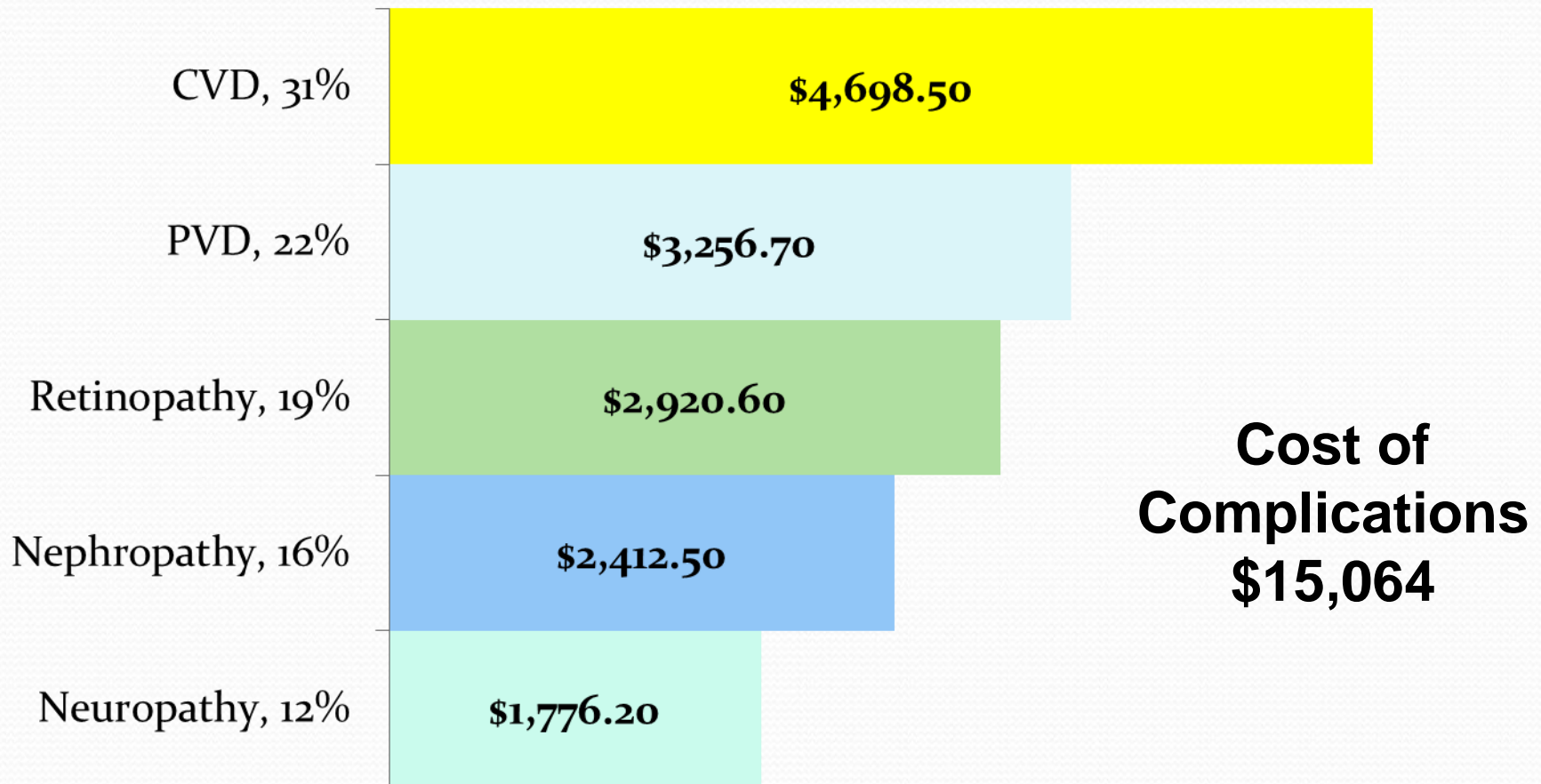
ITEM	AVERAGE COMERCIAL PRICE	PAHO'S STRATEGIC FUND
	2014US\$	
INSULIN	\$35	\$4.20
METFORMIN	\$17 (x100)	0.89
MEDICAL VISIT	\$36	-
MEDICAL VISIT OFTALMOLIGIST	\$53	
HOSPITAL DAY	\$480	
EMERGENCY ROOM VISIT	\$43	
Rx	\$29	
A1c	\$20	
LIPID PROFILE	\$26	
ALBUMINURIA	\$22	
EKG	\$26	

# Direct Cost (US\$X10<sup>6</sup>) of Diabetes in Latin America & the Caribbean, 2014

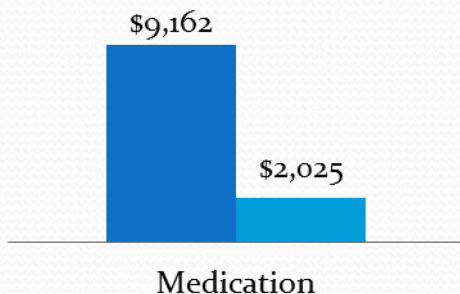
**Estimated  
Direct Cost of  
DM  
\$41,165.5**



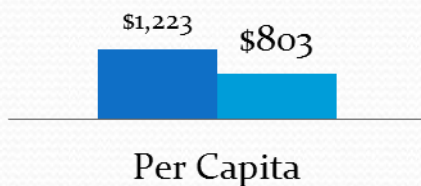
## Estimated Cost (US\$X10<sup>6</sup>) of Diabetes Complications in Latin America & the Caribbean



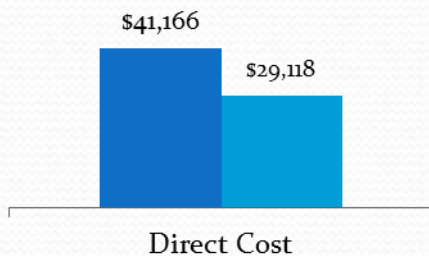
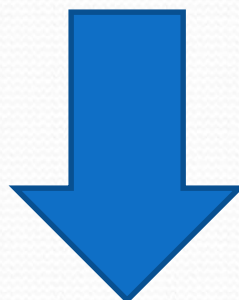
## Using PAHO's Strategic Fund's Prices for Insulin & Metformin



**Medication:  
Cost Reduced by 78%**



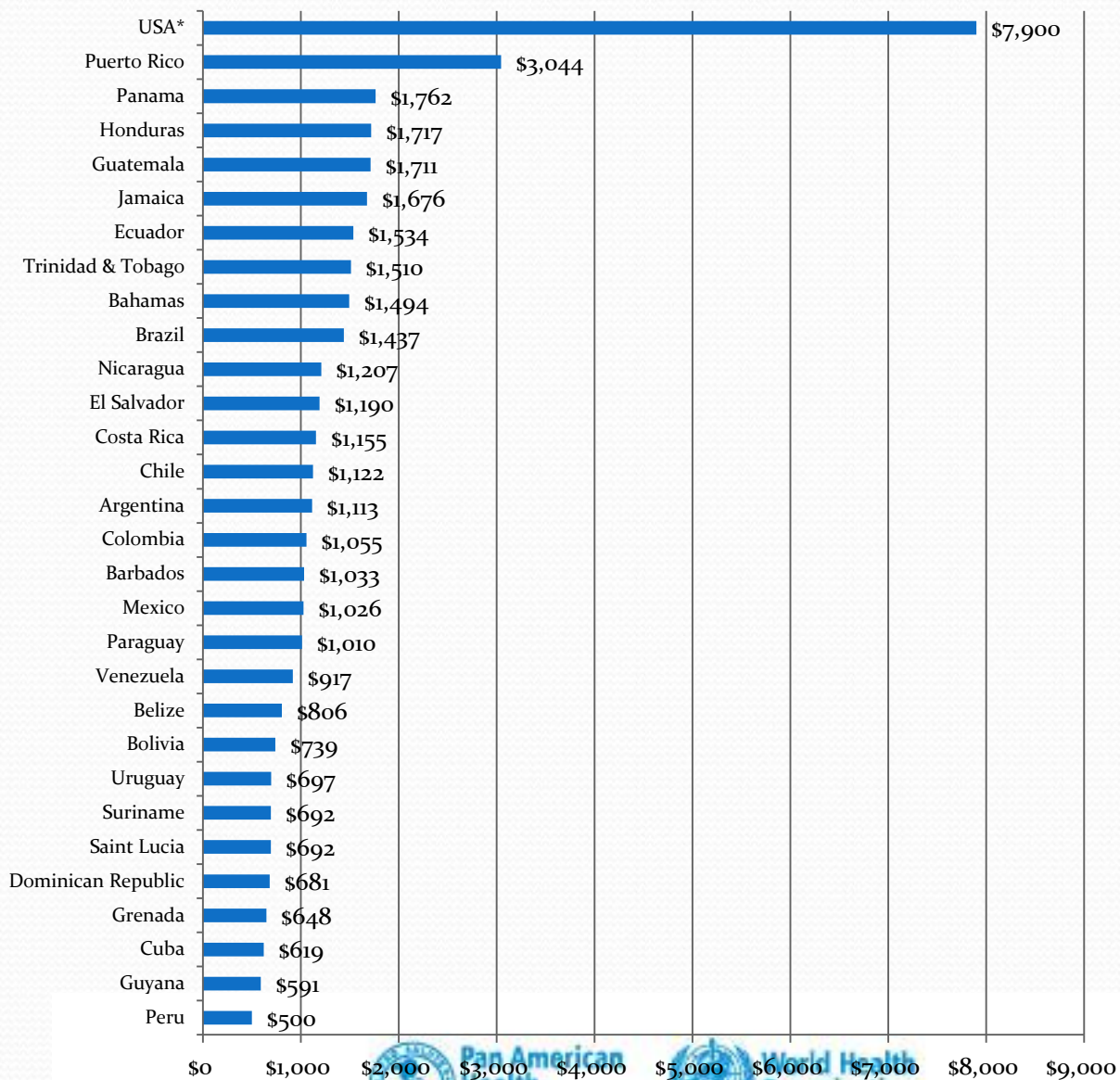
**Per Capita Cost of DM:  
Cost reduced by 34%**



**Direct Cost of DM:  
Cost reduced by 29%**



## Estimated annual per capita direct cost (US\$) of diabetes by country in LAC, 2014 and the US 2012

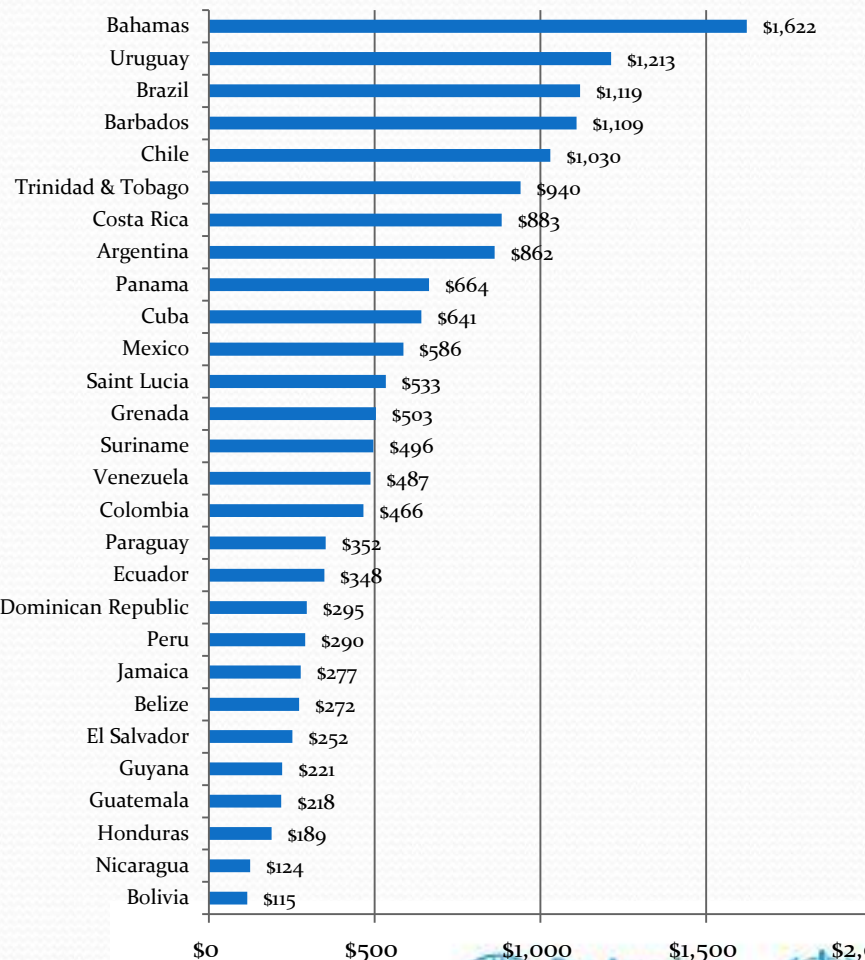


**Average estimated cost  
of DM in LAC  
\$1,223 per year**



\* American Diabetes Association.  
Economic Cost of Diabetes in the US in  
2012. Diabetes Care 2013;36:1033-1046

# National Health Expenditures in Latin America & the Caribbean, 2014



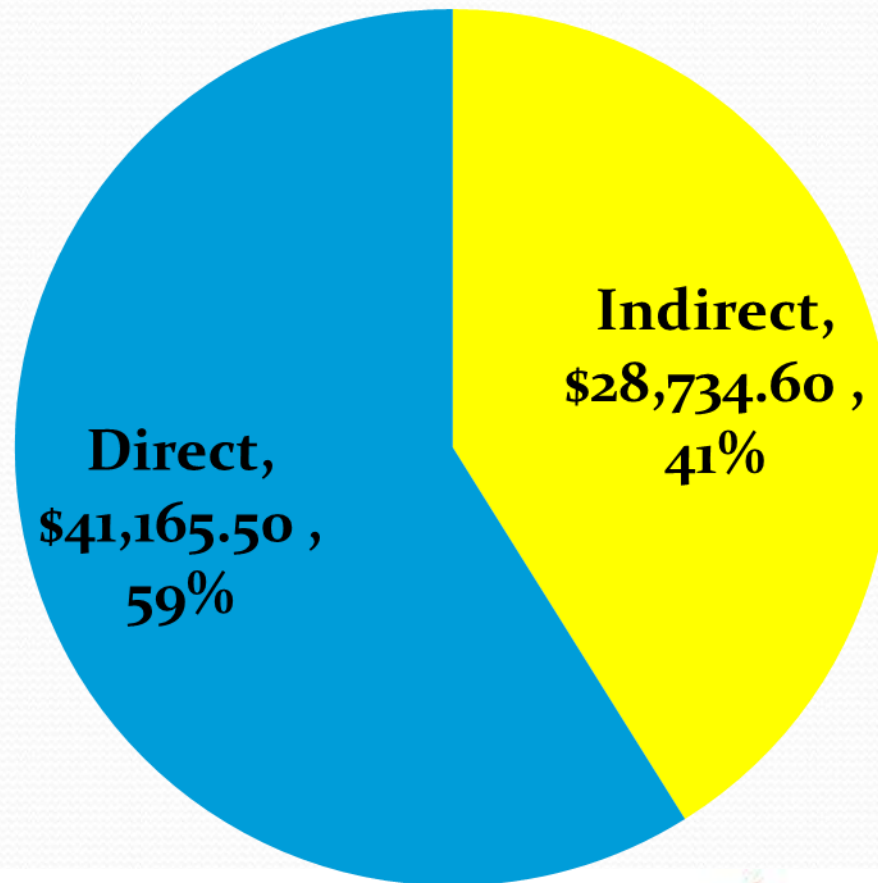
**Mean Per Capita Cost of DM US\$1,083\***  
**Mean NHE US\$575**  
**Excess Cost of DM +\$505**  
**Mean NHE (DM) US\$769\*\***





## The Cost (US\$X106) of Diabetes in Latin America & the Caribbean 2014

**Total  
estimated  
cost of DM  
\$69,900.1**



Add your text here



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# **Vida saludable** **Diabetes**

**PREVENIR Y CONTROLAR LA DIABETES ESTÁ EN TUS MANOS** [www.paho.org/diabetes](http://www.paho.org/diabetes)



día mundial de la diabetes  
14 de noviembre



Haré 30 minutos de actividad física la mayoría de los días



Comeré más pescado, fibras, frutas y vegetales



Tomaré los medicamentos indicados regularmente



Llevaré una #VidaSaludable para prevenir la #Diabetes



# **Healthy Lifestyle** **Diabetes**

THE PREVENTION AND CONTROL OF DIABETES IS IN YOUR HANDS [www.paho.org/diabetes](http://www.paho.org/diabetes)



# **Vida Saudável** **Diabetes**

A PREVENÇÃO E O CONTROLE DO DIABETES ESTÁ NAS SUAS MÃOS [www.paho.org/diabetes](http://www.paho.org/diabetes)



Farei 30 minutos  
de atividade  
física quase  
todos os dias

Comerei mais  
peixe, fibras,  
frutas e  
vegetais

Tomarei os  
medicamentos  
regularmente  
segundo me  
indicaram

Levarei uma  
#VidaSaudável  
para prevenir o  
#Diabetes

# نمط الحياة الصحي - السكري

الوقاية من السكري ومكافحته في أيديكم

مِنظَرَةُ الصَّحَّةِ الْعَالَمِيَّةِ  
المكتب الإقليمي لشرق المتوسط

سوف أمارس نشاطاً  
بدنياً لمدة ٣٠ دقيقة  
في معظم الأيام

سوف أتناول مزيداً  
من الأسماك والألياف  
والفواكه والخضروات

سوف أتناول أدويتي  
 بانتظام حسب  
التعليمات

سوف أتبع نمط حياة  
صحيحاً للوقاية من  
السكري

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Español:

[www.paho.org/conferenciadiabetesgestacional2015](http://www.paho.org/conferenciadiabetesgestacional2015)



[https://www.youtube.com/watch?v=Upa3F\\_8Vpjw](https://www.youtube.com/watch?v=Upa3F_8Vpjw)



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