

A close-up photograph of a hand holding a pen, with a shadow cast on a textured surface. The background is a light-colored, textured surface, possibly sand or a coarse fabric. The hand is holding a dark pen, and a long, dark shadow is cast across the surface from the hand and pen. The text is overlaid on the image.

**THE GLOBAL VIEW ON DF AND  
INNOVATIONS IN DEVELOPING  
COUNTRIES**

**Prof. Alberto Piaggese  
University of Pisa  
Italy**

## *Highlights:*

*10 million more adults with diabetes than 2015*

*34 million more adults are at risk of developing diabetes than 2015*

*8 million more adults above 65 years old with diabetes than 2015*

*USD 54 billion more is spent on diabetes than 2015*

*19 million more adults with diabetes are undiagnosed than 2015*

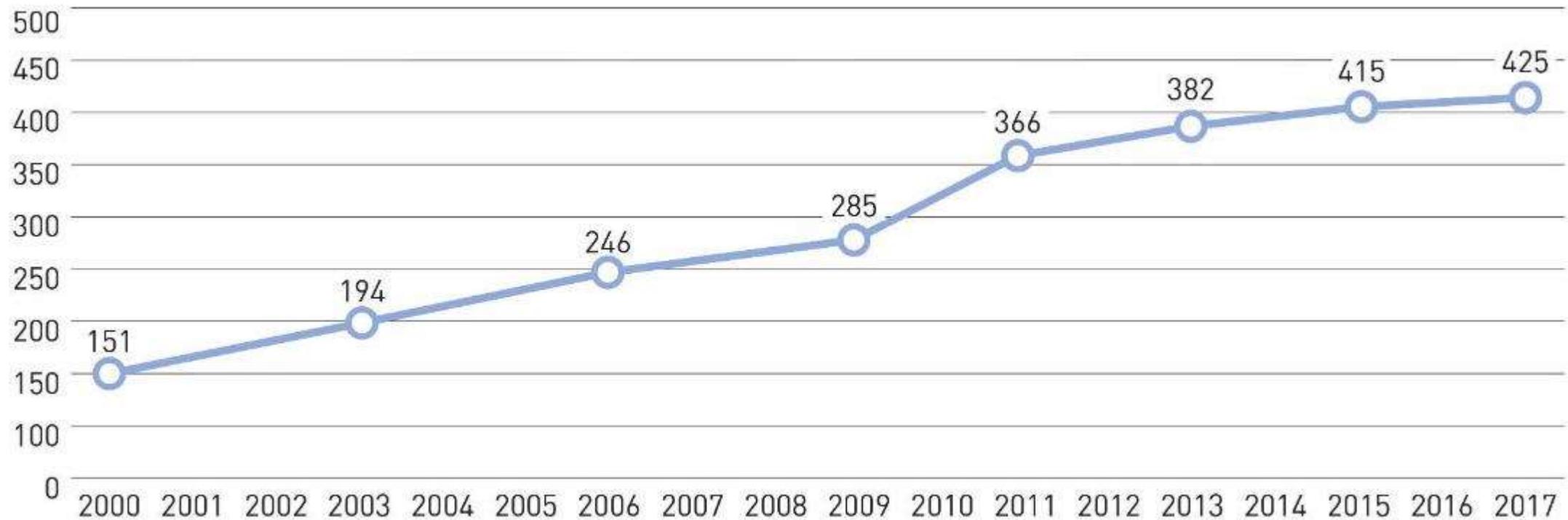
*1 in 6 live births is affected by hyperglycaemia in pregnancy*

*Over a million children and adolescents have type 1 diabetes*



# Diabetes around the world

Total number of adults with diabetes (20-79 years)





*Diabetes occurs when there **are raised levels** of glucose in the blood because the **body cannot produce any or enough** of the hormone **insulin** or use insulin effectively*

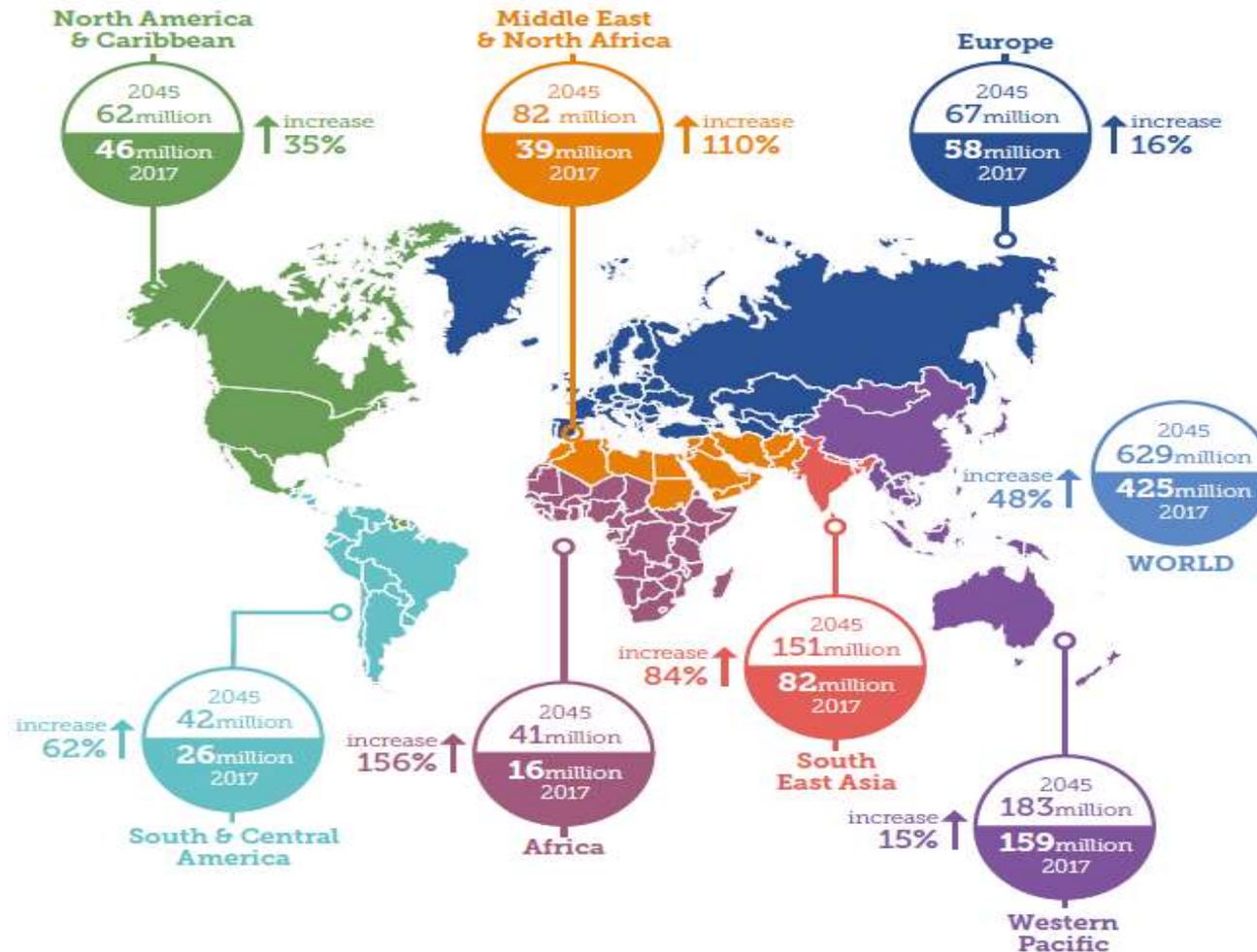
# Diabetes around the world

Estimated total number of adults (20-79 years) living with diabetes, 2017



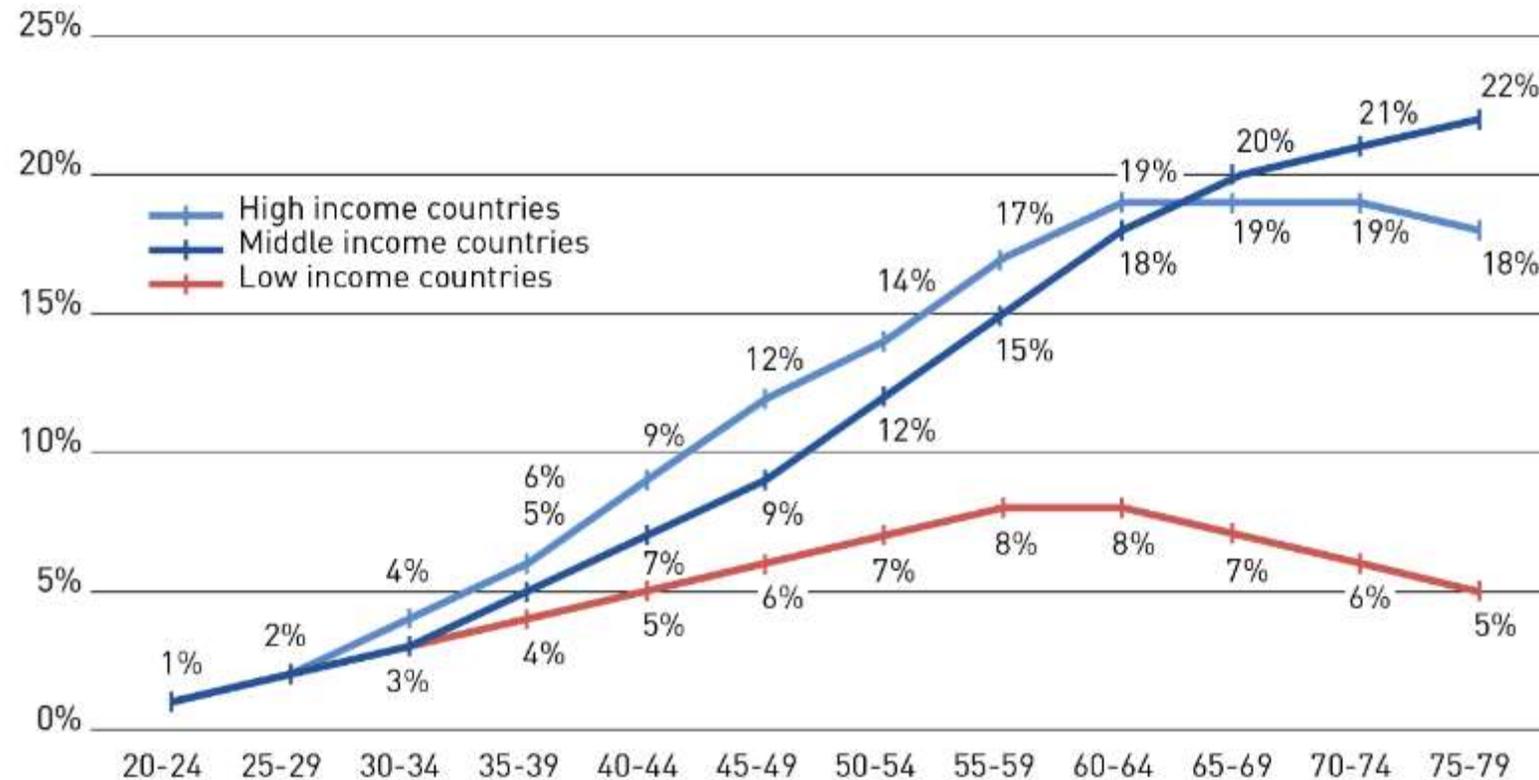
# Diabetes: A global emergency

Number of people with diabetes worldwide and per region in 2017 and 2045 (20-79 years)



# Diabetes around the world

Prevalence (%) estimates of diabetes (20-79 years) by income group and age



**“4 out of 5 people with diabetes live in low- and middle-income countries”**

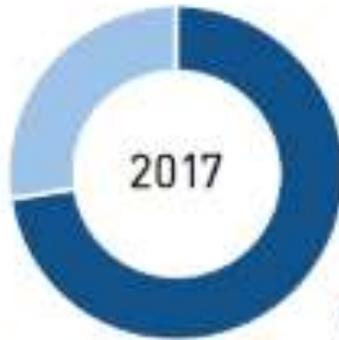


# Diabetes around the world

## Diabetes by age (20-79 years)



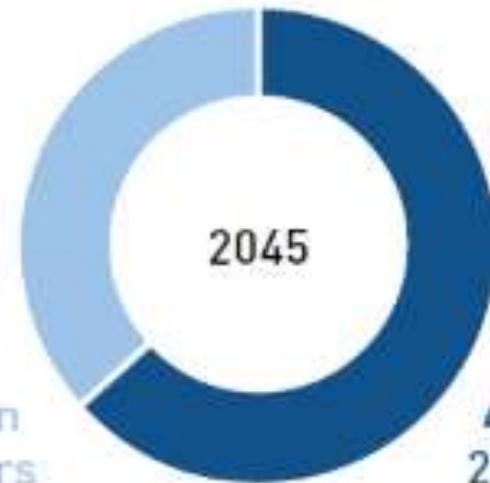
98 million  
65-79 years



327 million  
20-64 years



191 million  
65-79 years



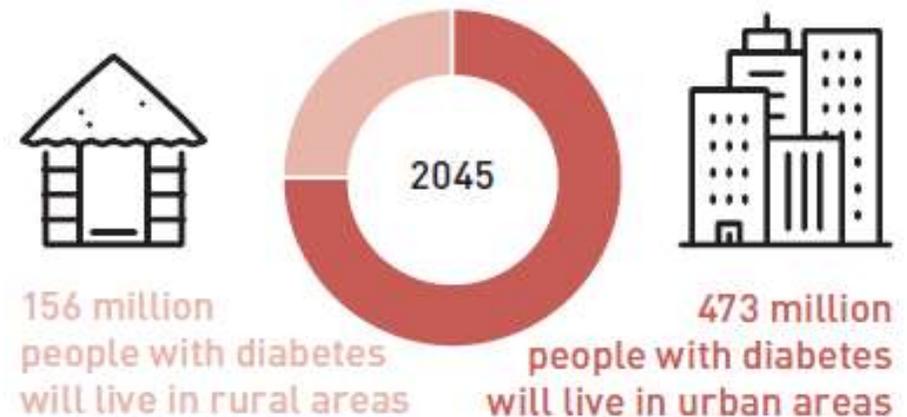
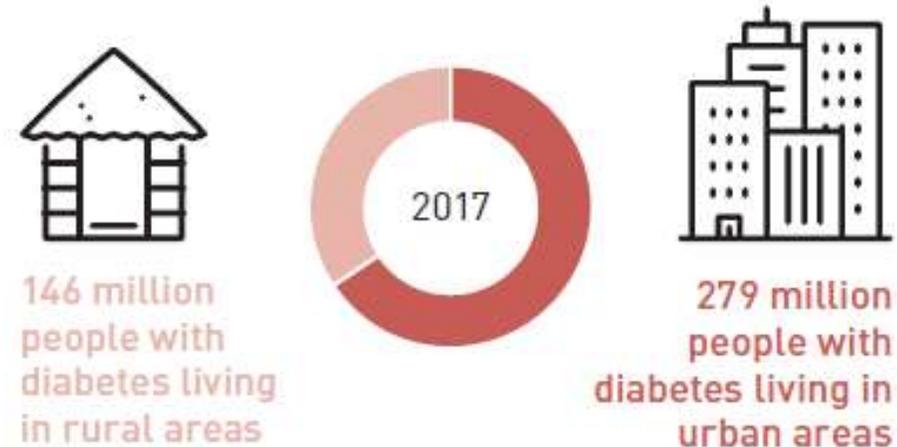
438 million  
20-64 years



# Diabetes around the world

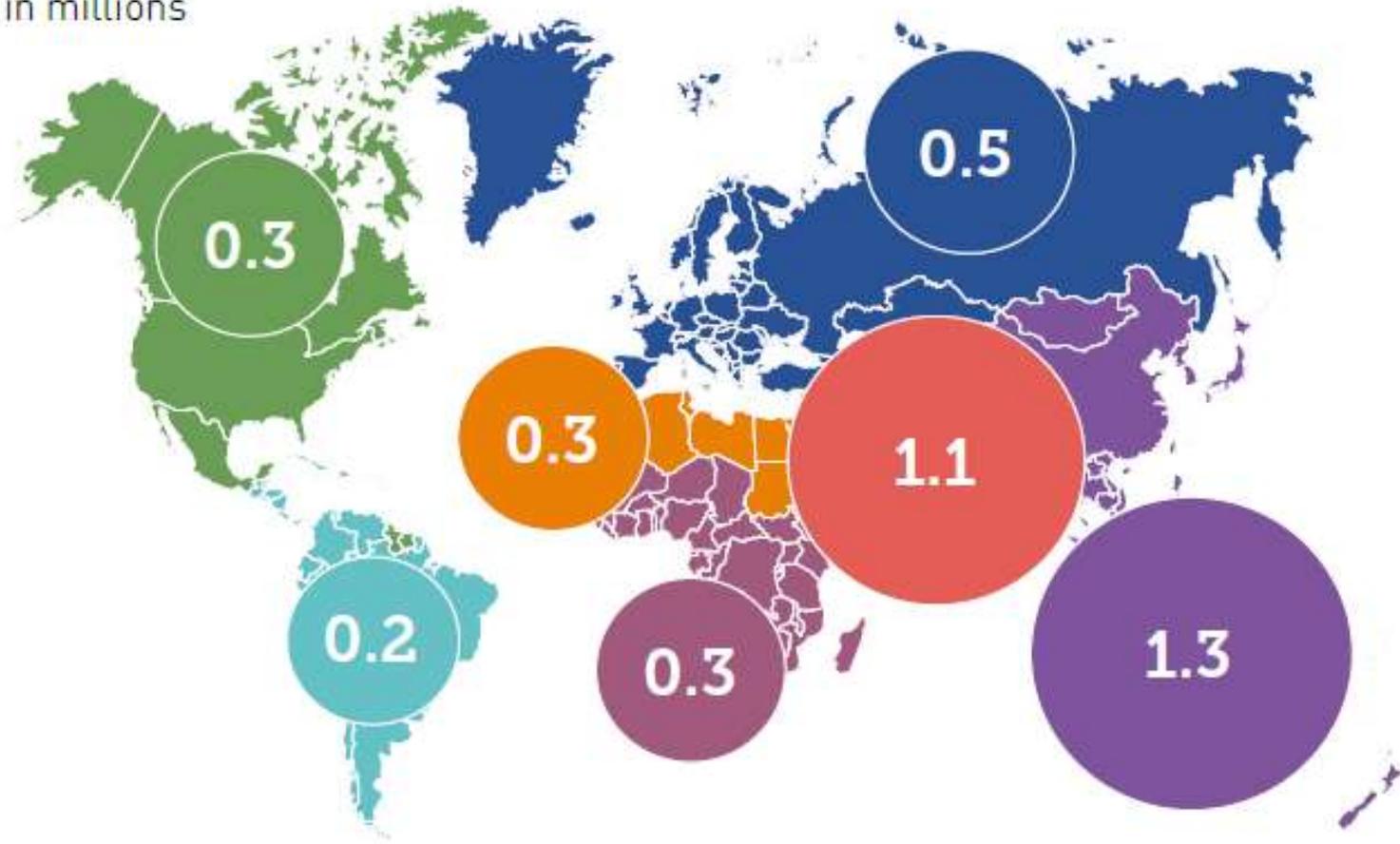
***“Two-thirds of people with diabetes live in urban areas and number will increase to three fourths by 2045”***

Rural-urban division among people with diabetes



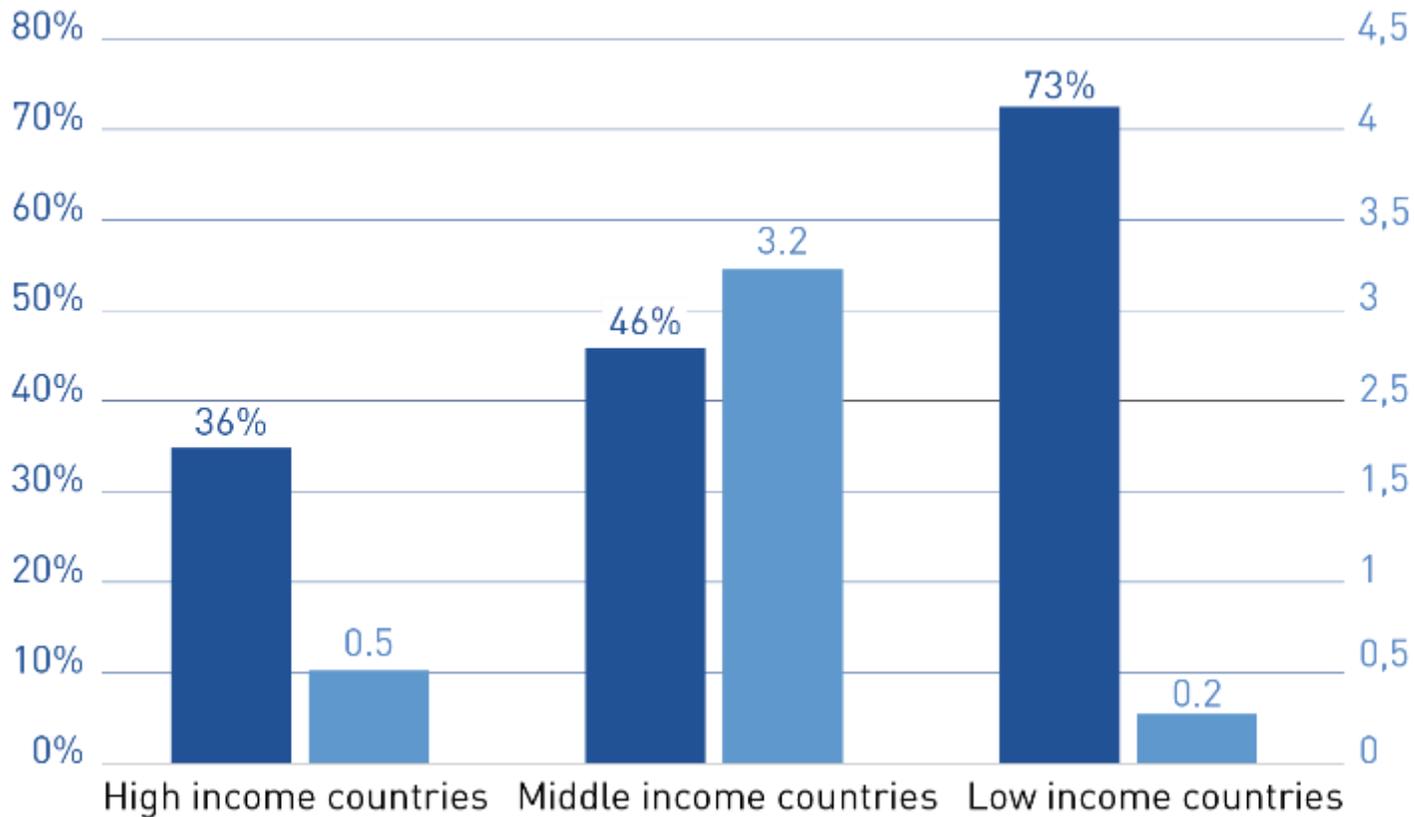
# Mortality

Number of deaths due to diabetes (20-79 years) in 2017  
in millions



# Mortality

Deaths attributable to diabetes by age (20-79 years)



*“Half of the 4 million people who die from diabetes are under the age of 60”*



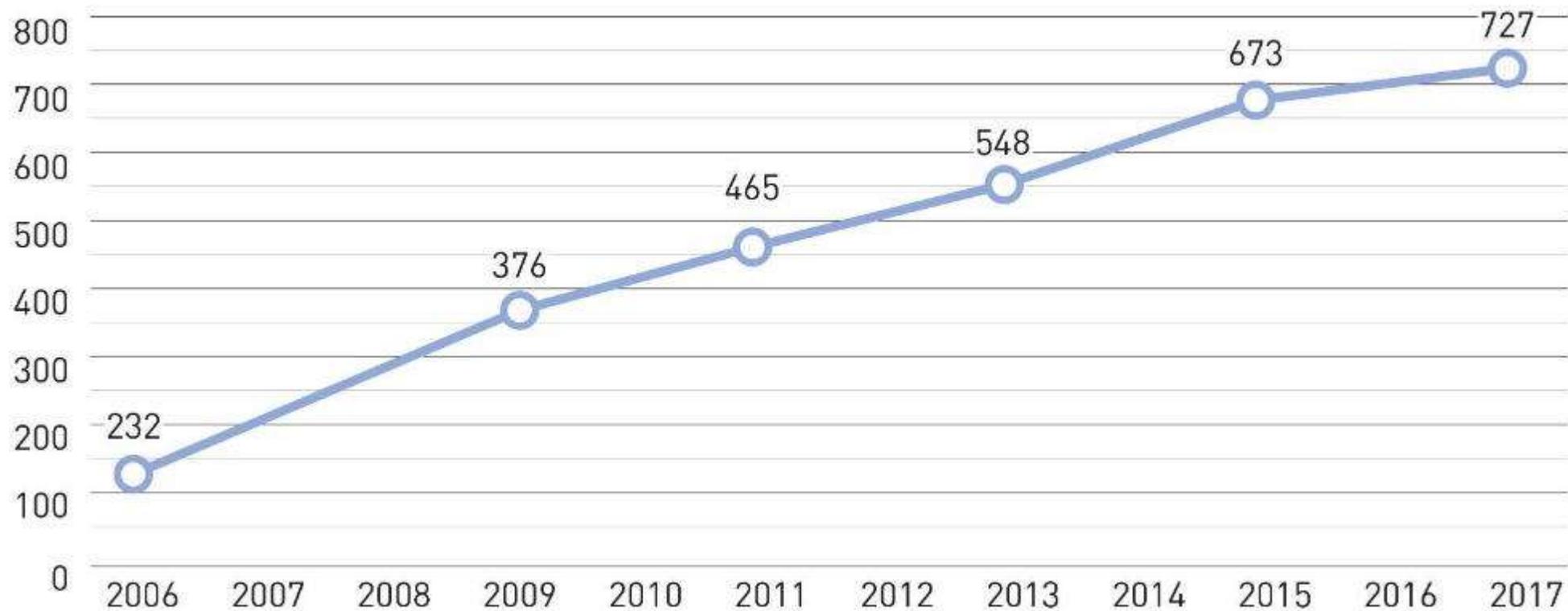
*There are **cost-effective and evidence-based** solutions to reverse the global type 2 diabetes epidemic*



# Healthcare Expenditure

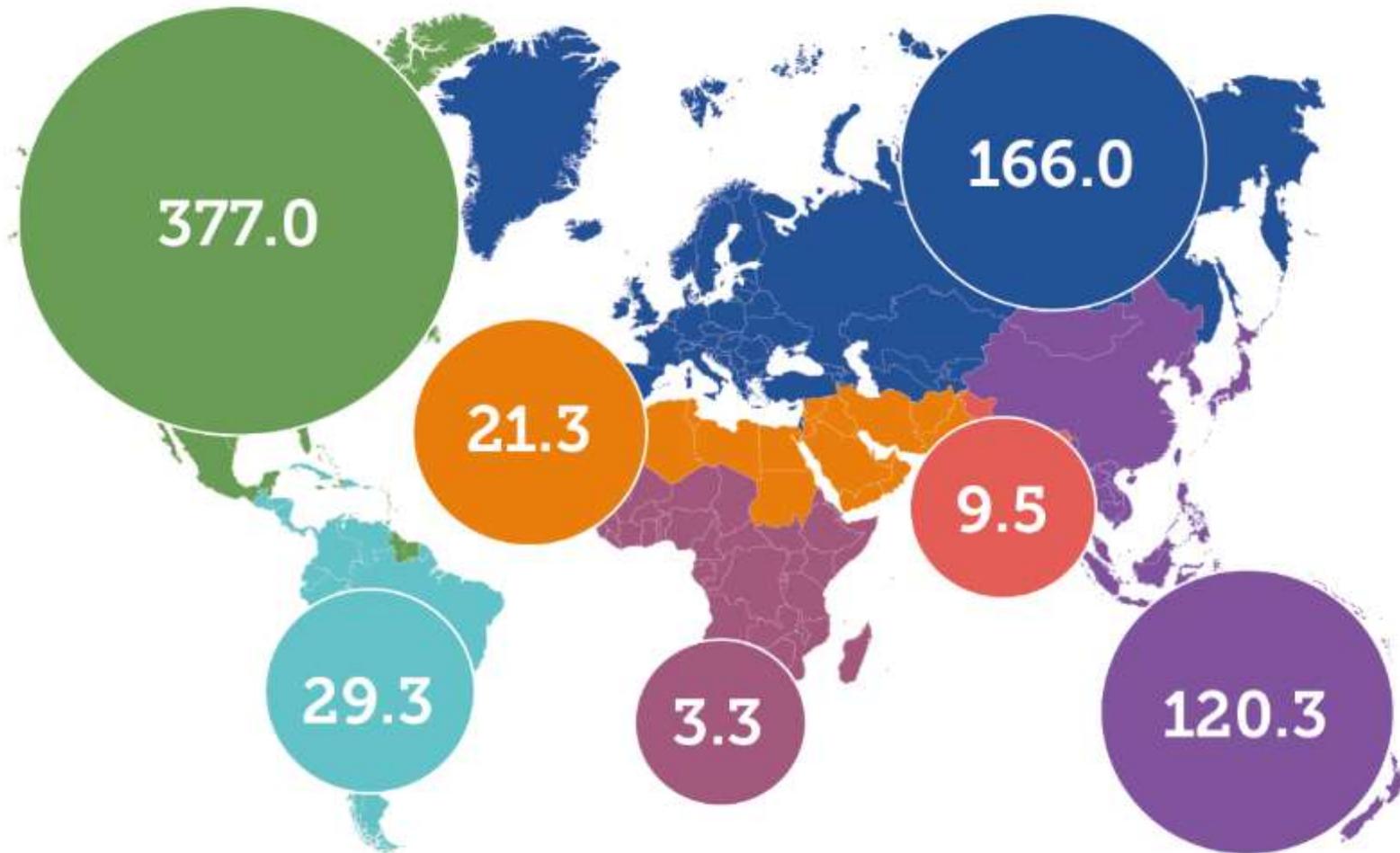
***“USD 54 billion more is spent on diabetes than 2015”***

Total healthcare expenditure by people with diabetes (20-79 years)



# Healthcare Expenditure

Diabetes-related healthcare expenditure in adults (20-79 years) in 2017 per IDF region



*Big differences in healthcare spent for diabetes across IDF regions*



# Diabetes Complications

People with diabetes are at **higher risk** of developing periodontal disease

Diabetic retinopathy affects over **one-third** of all people with diabetes and is the leading cause of vision loss in working-age adults

Pregnant woman with diabetes or at high risk for GDM should manage their glycaemia throughout their pregnancy to avoid long-term consequences for themselves and their children, and **transgenerational effects** (higher risk of obesity, diabetes, hypertension and kidney disease in the offspring)

People with diabetes are **2 to 3 times** more likely to have cardiovascular disease (CVD)

The prevalence of end-stage renal disease (ESRD) is up to **10 times higher** in people with diabetes

Every **30 seconds** a lower limb or part of a lower limb is lost to amputation somewhere in the world as a consequence of diabetes



## Deaths from DFU or DFU related amputation

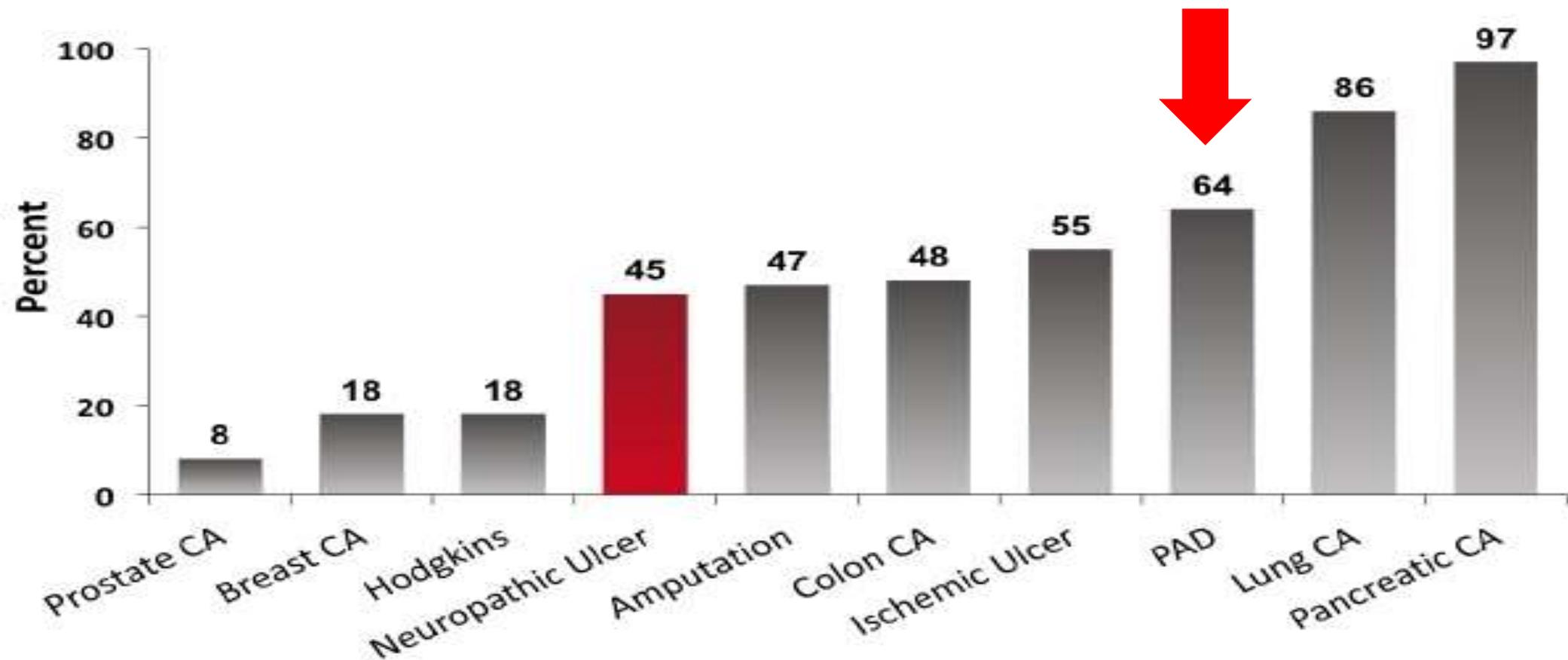
equal or exceed deaths from prostate cancer, breast cancer, and Hodgkin lymphoma combined<sup>14</sup>



Every 30 seconds a leg is lost to diabetes somewhere in the world<sup>15</sup>

Adapted from Armstrong DG et al. *Int Wound J.* 2007;7 (7):286-287.

# 5-Year Mortality Rates



Armstrong DG, Wrobel J, Robbins JM. Guest Editorial: are diabetes-related wounds and amputations worse than cancer? *Int Wound J.* 2007;4(4):286–287

Worldwide 2015 415 million people with diabetes  
 2040 642 million people with diabetes



2015  
  
 One in 11 adults has diabetes

2040  
  
 One in 10 adults will have diabetes

  
 One in two adults with diabetes is undiagnosed

International Diabetes Federation. IDF Diabetes Atlas, 7th edn. Brussels, Belgium: International Diabetes Federation, 2015. <http://www.idf.org/diabetesatlas>

# Diabetic Foot Prevalence

Developed Countries  
 one in every six people with diabetes will have an ulcer during their lifetime

Developing Countries  
 Foot problems estimated to account for 40% of available resources

[https://www.idf.org/webdata/site/background/Life\\_AFB.pdf](https://www.idf.org/webdata/site/background/Life_AFB.pdf)

# Prevention and Management of Foot Problems in Diabetes Guidance Documents and Recommendations

Development of  
Guidance Documents

Summary for  
Daily Practice

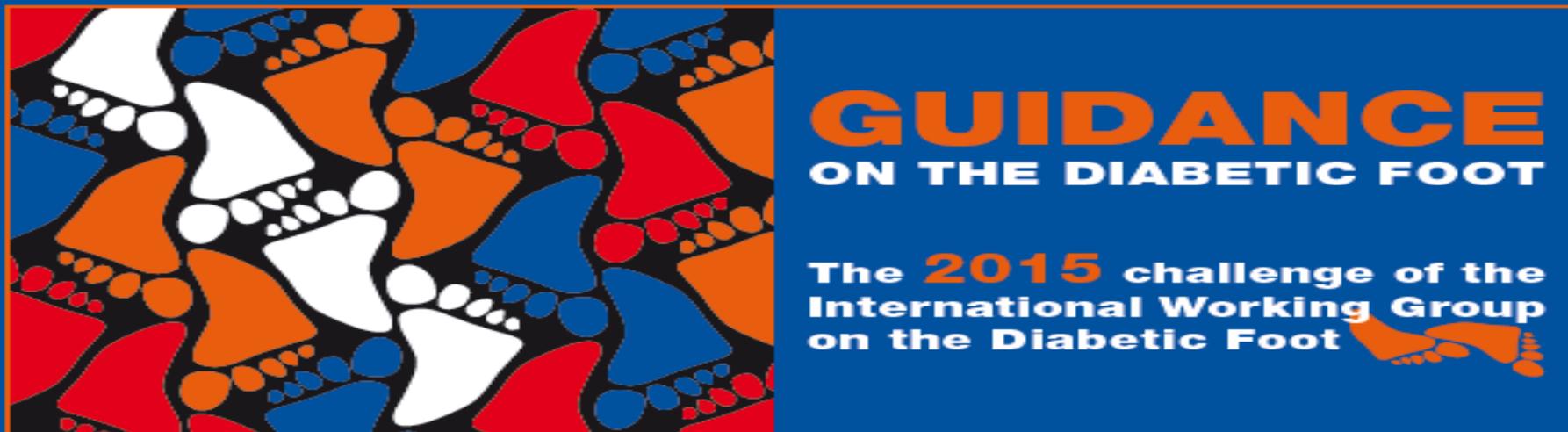
Guidance  
Prevention

Guidance  
Footwear and  
Offloading

Guidance  
Peripheral Artery  
Disease

Guidance  
Infection

Guidance  
Wound Healing



This information is linked with the International Consensus on the Diabetic Foot 2015 on the website [www.iwgdf.org](http://www.iwgdf.org). This is an interactive programme. You can choose how to access and read this information: front to back, topic by topic, on screen and on paper.



© 2015 International Working Group on the Diabetic Foot





As many as ...

**80%**



of **people with diabetes** live in

**LMIC countries**

But as few as ...

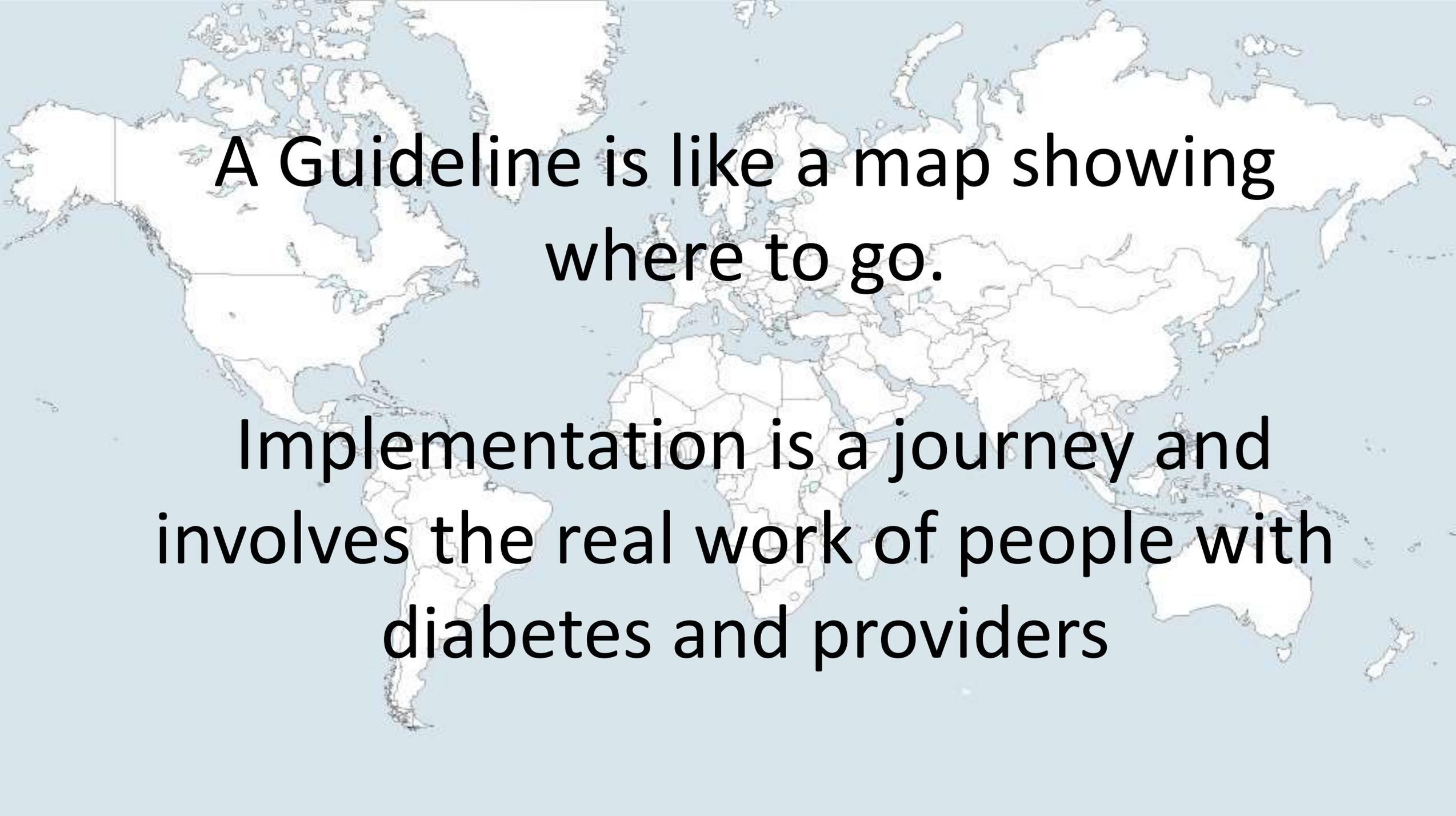
**9%**



of countries have

**recognised**

**podiatry care** ○



A Guideline is like a map showing  
where to go.

Implementation is a journey and  
involves the real work of people with  
diabetes and providers

# CRITICAL ISSUES

- Unawareness
- Undestimation
- Lack of resources
- Gap of knowledge
- Lack of skills
- Poor organization





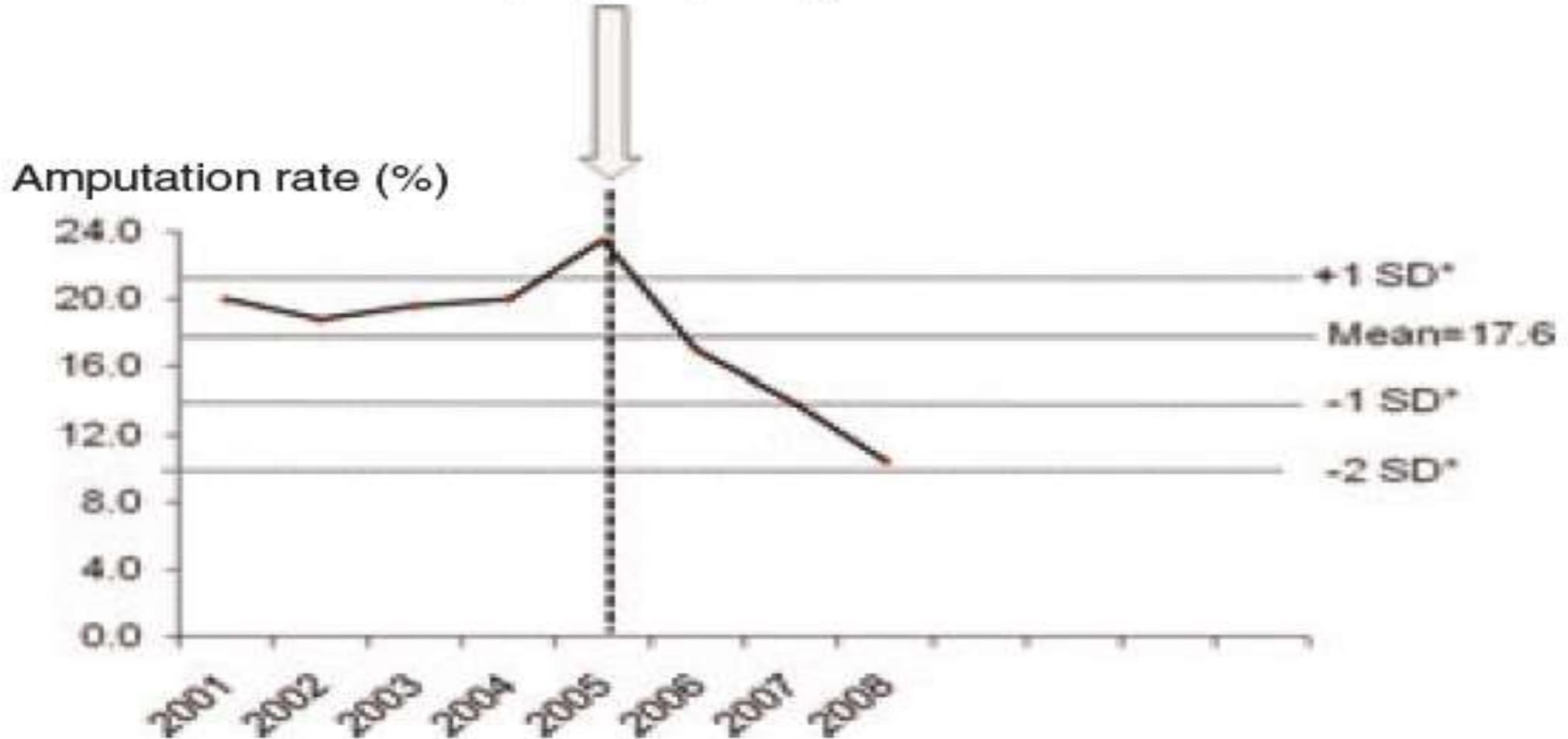
Train-the-Foot-Trainer projects in  
SACA , NAC, EUR region, WP  
Later: Africa

# The 'Step by Step' Diabetic Foot Project in Tanzania: a model for improving patient outcomes in less-developed countries

Zulfiqarali G Abbas, Janet K Lutale, Karel Bakker, Neil Baker, Lennox K Archibald



## Step by Step Program



\*SD: standard deviation



HEALTH IN ACTION

# The Guyana Diabetes and Foot Care Project: A Complex Quality Improvement Intervention to Decrease Diabetes-Related Major Lower Extremity Amputations and Improve Diabetes Care in a Lower-Middle- Income Country



**Julia Lowe<sup>1\*</sup>, R. Gary Sibbald<sup>2</sup>, Nashwah Y. Taha<sup>1</sup>, Gerald Lebovic<sup>3</sup>, Carlos Martin<sup>4</sup>,  
Indira Bhoj<sup>4</sup>, Rolinda Kirton<sup>5</sup>, Brian Ostrow<sup>6</sup>, the Guyana Diabetes and Foot Care  
Project Team<sup>¶</sup>**

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**¶** Membership of the Guyana Diabetes and Foot Care Project Team is provided in the Acknowledgments.

\* [Julia.Lowe@sunnybrook.ca](mailto:Julia.Lowe@sunnybrook.ca)

 OPEN ACCESS

**Citation:** Lowe J, Sibbald RG, Taha NY, Lebovic G, Martin C, Bhoj I, et al. (2015) The Guyana Diabetes and Foot Care Project: A Complex Quality Improvement Intervention to Decrease Diabetes-Related Major Lower Extremity Amputations and



# Summary Points

- Type 2 diabetes is the fourth leading cause of death and affects 15.5% of the adult population in Guyana, South America.
- Preintervention, 41.4% of individuals with diabetic foot complications experienced major lower extremity amputation at the national referral hospital.
- A complex, interprofessional quality improvement intervention to improve diabetes and foot care was rolled out in two phases between 2008–2013.
- We report the experience from this unique nationwide intervention, with a national referral hospital prototype (phase 1) regionalized to six administrative regions in Guyana comprising 89% of the population (phase 2).



**Table 3. Comparison of Foot Care Projects.**

	<b>Step by Step<sup>1</sup></b>	<b>Guyana Diabetes and Foot Care Project</b>	<b>The Samadhan System<sup>2</sup></b>
<b>Brief Description</b>	Incorporates longitudinal training of HCP with follow-up sessions and hands-on practical training.	Similar educational approach to Step by Step using a formal key opinion leader team (“train the trainer model”). Builds capacity in the public-funded health system through facility development and provision of new clinical tools.	Encourages one specialist to gain knowledge in all areas of diabetes care, including nutritional and podiatric education, in order to provide adequate care in a resource-limited setting.
	Encourages provider and patient education for knowledge dissemination	Integrated into Ministry of Health Strategic Plan.	
<b>Location</b>	Tanzania, India, Sri Lanka, Nepal, and Bangladesh	Guyana	India
<b>Sustainability and Capacity Building</b>	Yes	Yes	No
<b>Multidisciplinary</b>	Yes	Yes	No
<b>Education</b>	Yes	Yes	No
<b>Main Differences</b>	<ul style="list-style-type: none"> <li>• Restricted to diabetic foot management</li> <li>• Spans multiple countries</li> </ul>	<ul style="list-style-type: none"> <li>• Integrates diabetic foot care into CNCD care in public-funded health system</li> <li>• Facilitates capacity building through infrastructure (clinic) development and introduction of new clinical tools (e.g., HbA1c testing and plantar pressure redistribution devices)</li> </ul>	A cheap (US\$1), effective, and simple to use offloading tool was designed and used by author

<sup>1</sup>Abbas ZG, Lutale JK, Bakker K, Baker N, Archibald LK. The “Step by Step” Diabetic Foot project in Tanzania: a model for improving patient outcomes in less developed countries. *Int Wound J.* 2011;8:169–175

<sup>2</sup> Shankhdhar K. Improvisation is the key to success: The Samadhan system. *Adv Skin Wound Care.* 2006;19(7): 379–383

# RESULTS

	Before	After	Significance
LEA per month	7.95±4.05	3.89±2.30	p<0.05

Overall reduction of LEA of 68% after the intervention

A satellite-style map of Europe and the Mediterranean region. The land is shown in shades of green and brown, while the sea is dark blue. Three white text boxes with square bullet points are overlaid on the map. The first box is in the north, the second is in the center, and the third is in the south.

- 60 M inhabitants

- 3 M DM

- 300.000 DF

- 3,75 M inhabitants
- 225.000 DM
- 2.600 DF

# FROM 12 TO 3 LOCAL HEALTH AUTHORITIES

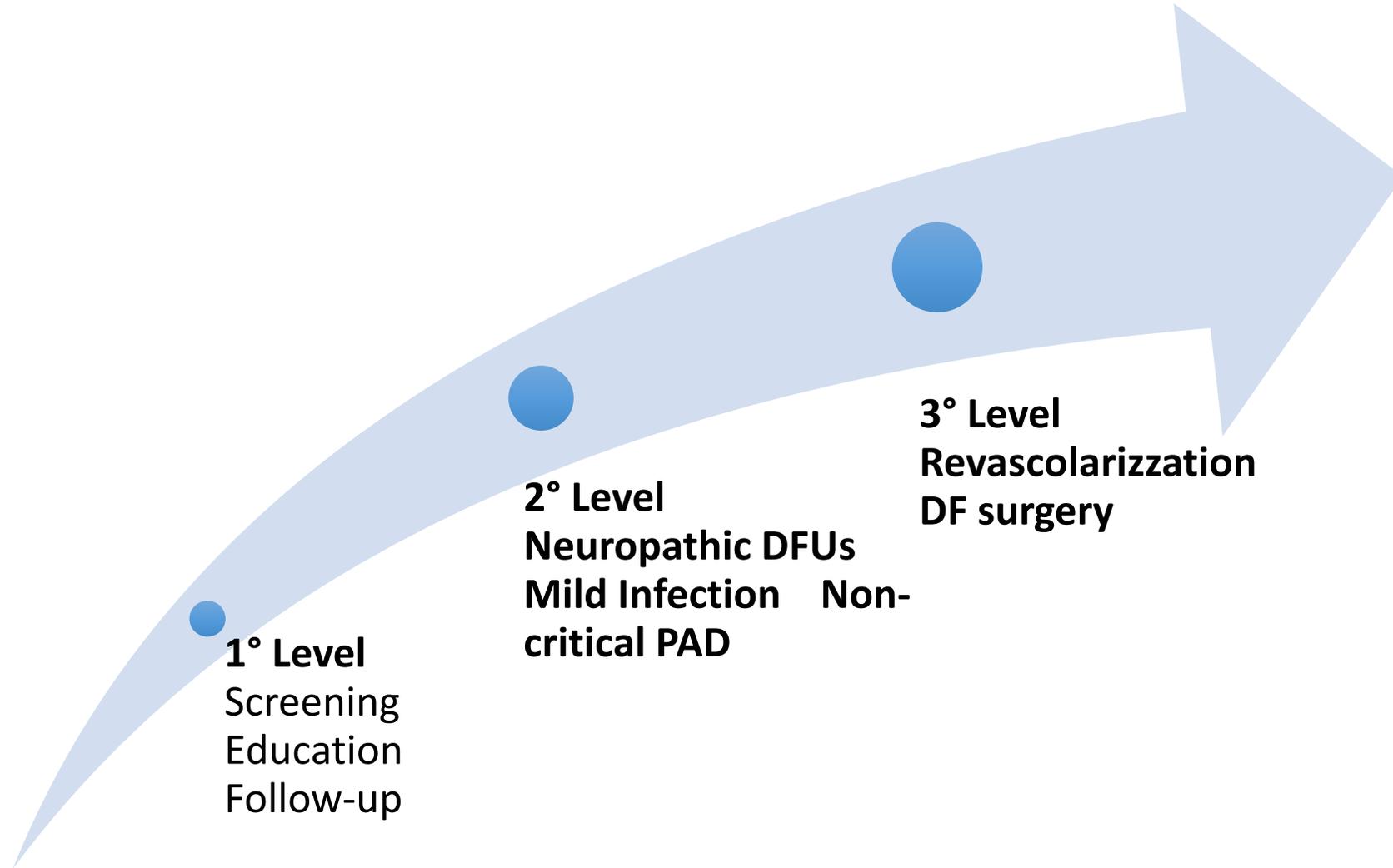


31/XII/2013



1/I/2014

# LEVELS BY FUNCTIONS







Personale Sanitario e Barellati

USCITA EMERGENZA

USCITA DI EMERGENZA



ALVA CARTA  
DR

Foliodra



# PRO-ACTIVE SCREENING OF DF

Year	N. Diabetic Patients (%)	N. Screening (%)	N. High Risk (%)	N. DFU (%)
2014	6767 (1.6%)	2442 (36.1%)	21 (0.8%)	5 (0.2%)
2015	7016 (1.7%)	3856 (54.9%)	52 (1.3%)	8 (0.3%)
2016	9435 (2.2%)	6817 (72.2%)	144 (2.1%)	31 (0.5%)



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**RESEARCH AND THEORY**

# Bridging the Gap between Theory and Practice in Integrated Care: The Case of the Diabetic Foot Pathway in Tuscany

Sabina Nutti\*, Barbara Bini\*, Tommaso Grillo Ruggieri\*, Alberto Piaggese† and Lucia Ricci‡

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**Introduction and Background:** As diabetic foot (DF) care benefits from integration, monitoring geographic variations in lower limb Major Amputation rate enables to highlight potential lack of Integrated Care. In Tuscany (Italy), these DF outcomes were good on average but they varied within the region. In order to stimulate an improvement process towards integration, the project aimed to shift health professionals' focus on the geographic variation issue, promote the Population Medicine approach, and engage professionals in a community of practice.

**Method:** Three strategies were thus carried out: the use of a transparent performance evaluation system based on benchmarking; the use of patient stories and benchmarking analyses on outcomes, service utilization and costs that cross-checked delivery- and population-based perspectives; the establishment of a stable community of professionals to discuss data and practices.

**Results:** The project enabled professionals to shift their focus on geographic variation and to a joint accountability on outcomes and costs for the entire patient pathways. Organizational best practices and gaps in integration were identified and improvement actions towards Integrated Care were implemented.

**Conclusion and Discussion:** For the specific category of care pathways whose geographic variation is related to a lack of Integrated Care, a comprehensive strategy to improve outcomes and reduce equity gaps by diffusing integration should be carried out.

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**Keywords:** diabetes; diabetic foot; geographic variation; performance evaluation; benchmarking; sentinel events; engagement

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# Pisa International Diabetic Foot Course

Management of the Diabetic Foot

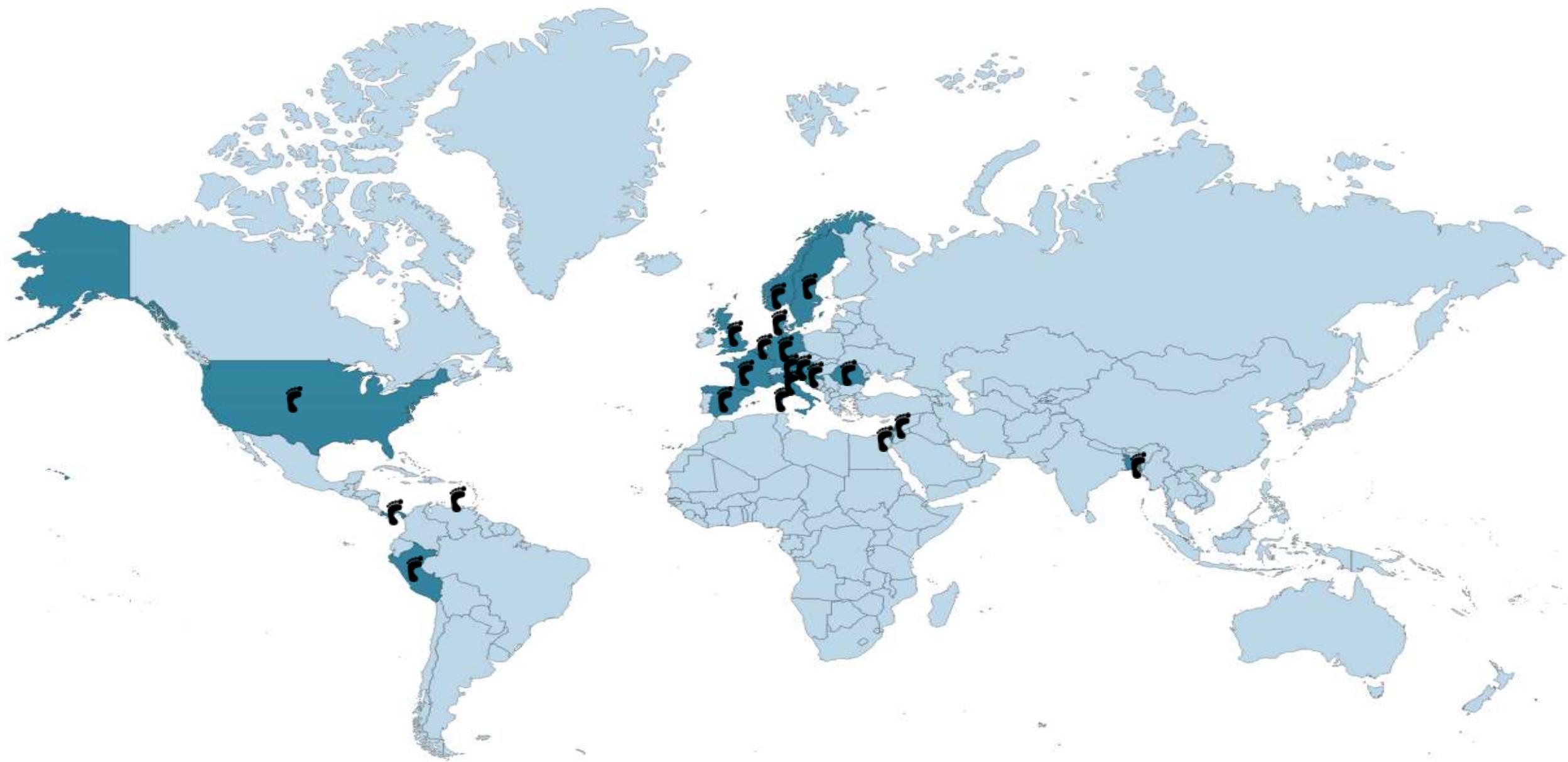


WELCOME TO  
THE **10TH** PISA INTERNATIONAL DIABETIC FOOT COURSE IN PISA!





The 10th Pisa International Diabetic Foot Course





# IN CRISES OPPORTUNITIES...



# THE NEXT STEPS

- EWMA and IWGDF partnership
- Implementation of DF Guidance by EWMA, Wound Australia and AAWC
- Fundraising and advocacy
- Sponsoring the participation of teams at the DF International Course
- Audit and mentorship for the newly instituted DF Centres
- Follow-up and measuring the outcomes



11<sup>th</sup> Pisa International Diabetic Foot Course 2019

# Management of the Diabetic Foot



Theory & Practice  
2 - 5 October 2019

Save  
the Date



[diabeticfootcourses.org](http://diabeticfootcourses.org)

