



STEMI South Africa – current situation and future plans, inspired by SFL

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STENT FOR LIFE



Stent for Life is a joint initiative between the European Association of Percutaneous Cardiovascular Interventions (EAPCI), a registered branch of the European Society of Cardiology (ESC), and EuroPCR

Introduction

International guidelines emphasize early appropriate treatment for S-T elevation Myocardial Infarction (STEMI) where “Time is Muscle”. In alignment with the Stent-for-Life initiative, of which South Africa is now an affiliated country, the SA Heart Association (SAHA) and the South African Society of Cardiovascular Intervention (SASCI) seek to improve the management of acute coronary syndrome (ACS) patients in South Africa, saving lives, and more importantly, ensuring a better outcome for all STEMI cases and less of a cardiovascular disease (CVD) burden to society as a whole.

Background information on the health care context in South Africa is provided, followed by research reports on STEMI management in this country, SAHA/SASCI STEMI Early Reperfusion Project achievements to date, and future objectives for SFL South Africa.

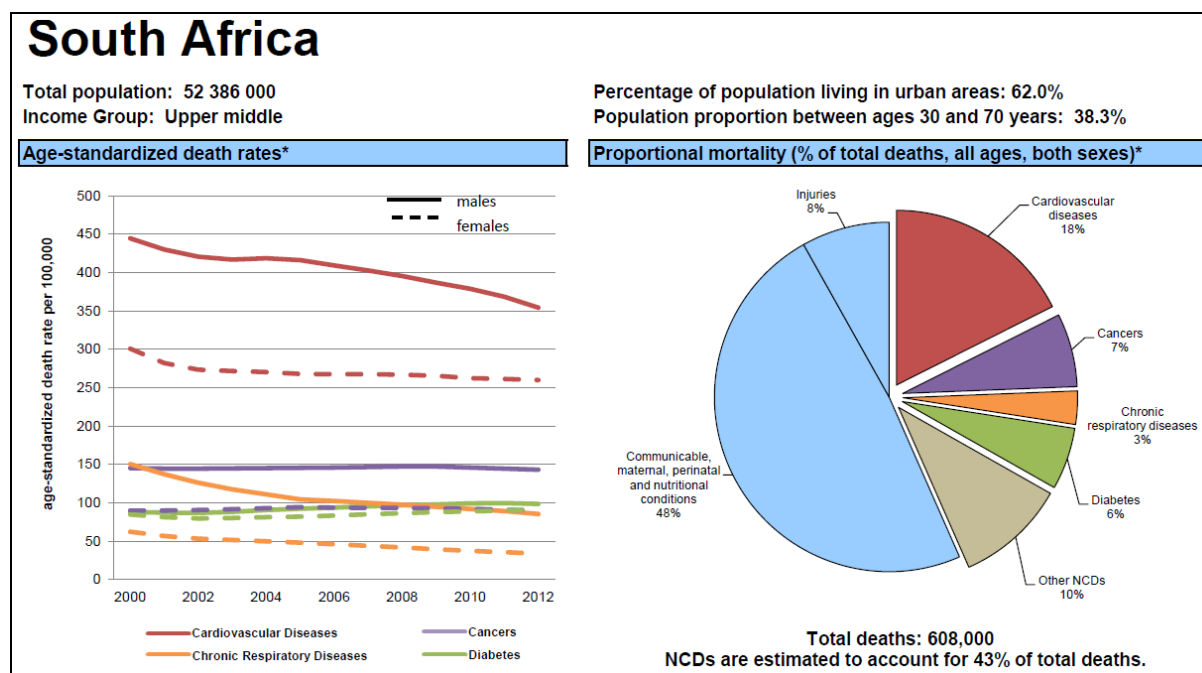
Current situation in South Africa

To understand the barriers to effective STEMI management in this country we need to be cognoscente about general country indicators, as monitored by the World Health Organization and reported in Table 1 (From: <http://data.worldbank.org/data-catalog/world-development-report-2014>).

Table 1 Country indicators for South Africa and other facts	
Population (000s)	52.776
Life expectancy at birth	59 years
World Bank income group	Upper-middle
Per capita total health expenditure (PPT Int \$)	982
Cause of death: Non-communicable diseases % of population	43
Cause of death: Ischaemic heart disease % of population	24
Only 0.7 physicians and 1.1 nurses per 1000 population	

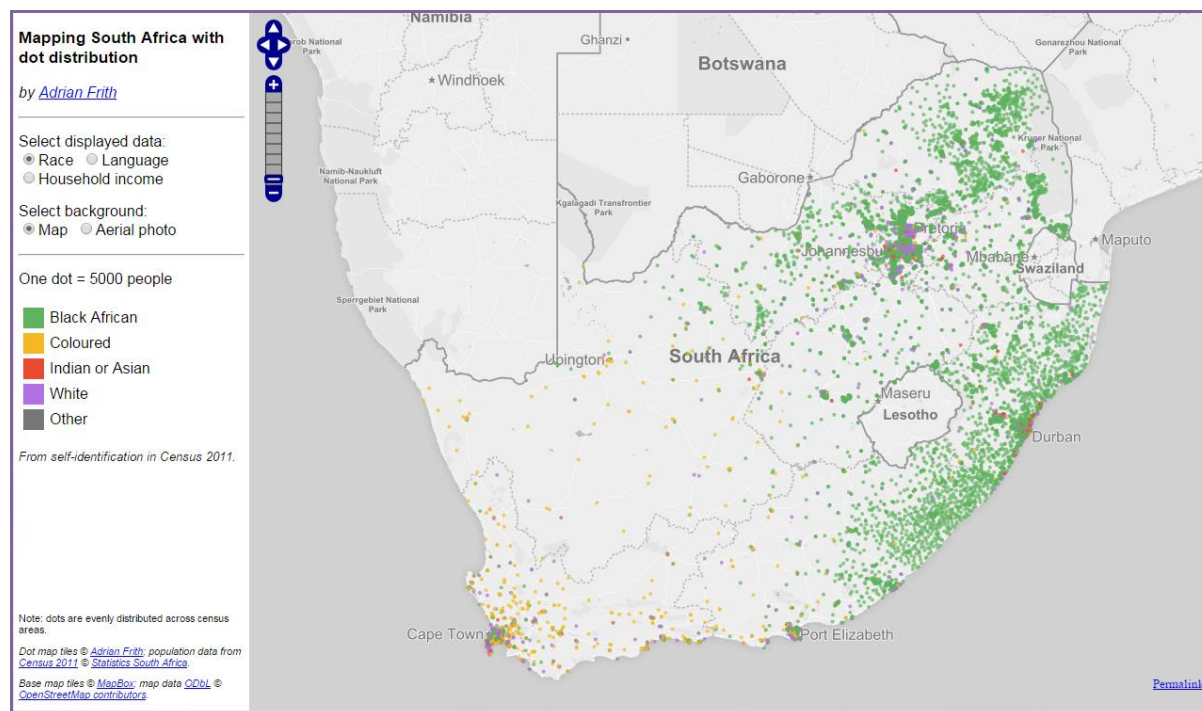
The WHO estimates that NCDs will exceed communicable diseases (NCD) as the leading cause of death in Africa in 2030 [1]. Currently estimates for deaths attributable to NCD amount to 43% of total deaths, and from the age-standardized death rates for males and females we observe CVD to be the main cause of all NCDs for both sexes, despite the fact that 40% of the population live in rural areas, as illustrated in Figure 1 (From: <http://www.who.int/nmh/countries/en/>). Concern has been expressed by leading cardiologists in Africa about the lack of preparedness of health care services in this continent [2]. This may be attributable to paucity of surveillance data and registries, shortage of physicians and cardiologists, interventional measures not being in place, inadequate diagnostic capabilities, and misguided opinions, as reported [3-5].

Figure 1 Non-communicable disease profiles for South Africa 2014



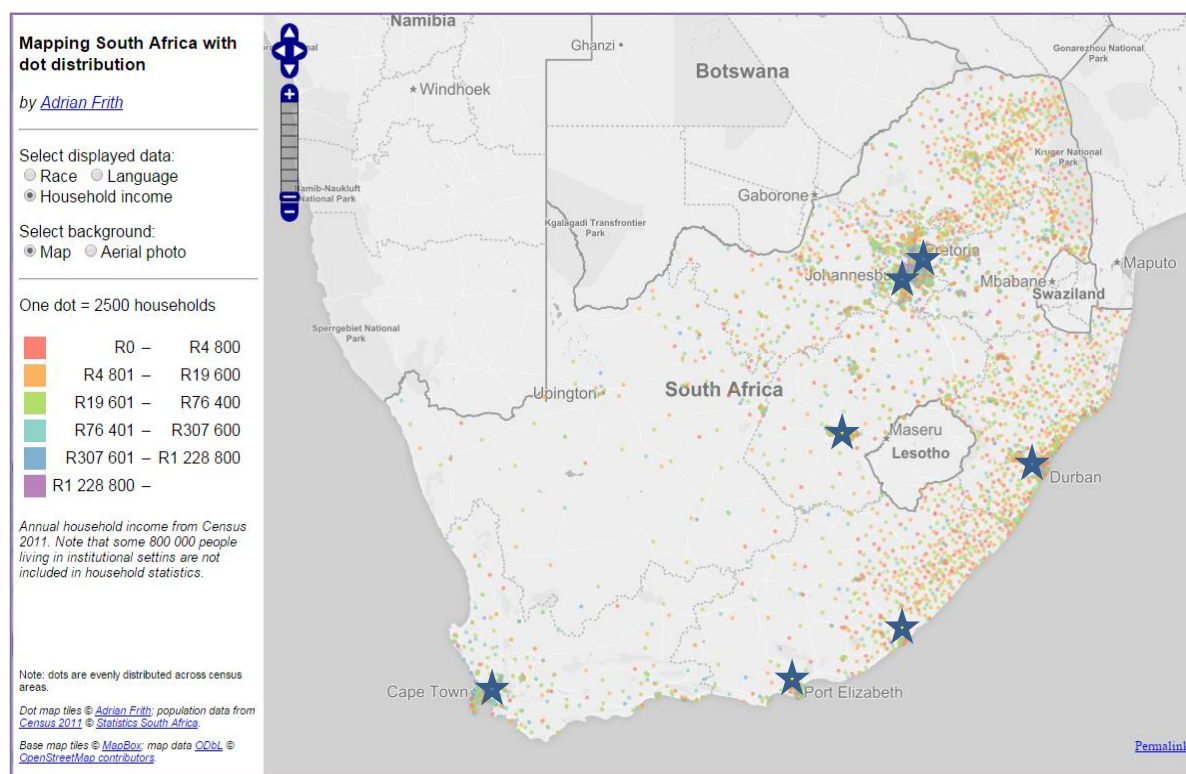
Dispersion of the population across South Africa, as well as the distribution of race groups, as illustrated in Figure 2, is of concern in prevention and timely management of ACS. Black Africans mostly live in remote areas, and a strategy needs to be developed timely to assure positive outcome for STEMI cases.

Figure 2 Distribution of race groups across South Africa (2011 Census data)



Household income compounds the problem of inadequate health care provision and also lack of transport to facilities where optimal care can be provided timeously. The distribution of households in the different income categories are demonstrated in Figure 3 relative to the location of PCI-capable facilities.

Figure 3 Distribution of household income groups across South Africa (2011 Census data)



Other relevant information sourced from Government statistics [6] pertains to utilization of health care facilities. Public sector clinics services are utilized by 61.2% of households, public hospitals by 9.5% and private hospital, private clinic and other service only about 5% of the households. Additional information needed for the development of systems of care that facilitate timely management of STEMI, is depicted in tables copied from this report and represents utilization of health facilities by race groups (Table 2), and also time taken to reach the facility normally used (Table 3).

Table 2 Percentage distribution of households by type of health facility used classified by population group

Characteristics	Type of health facility			
	Public sector	Private sector	Other	Total
South Africa	70,6	27,9	1,5	100,0
Population group				
Black African	81,3	17,2	1,5	100,0
Coloured	63,1	35,5	1,4	100,0
Indian/Asian	35,6	64,1	0,3	100,0
White	10,5	88,0	1,5	100,0

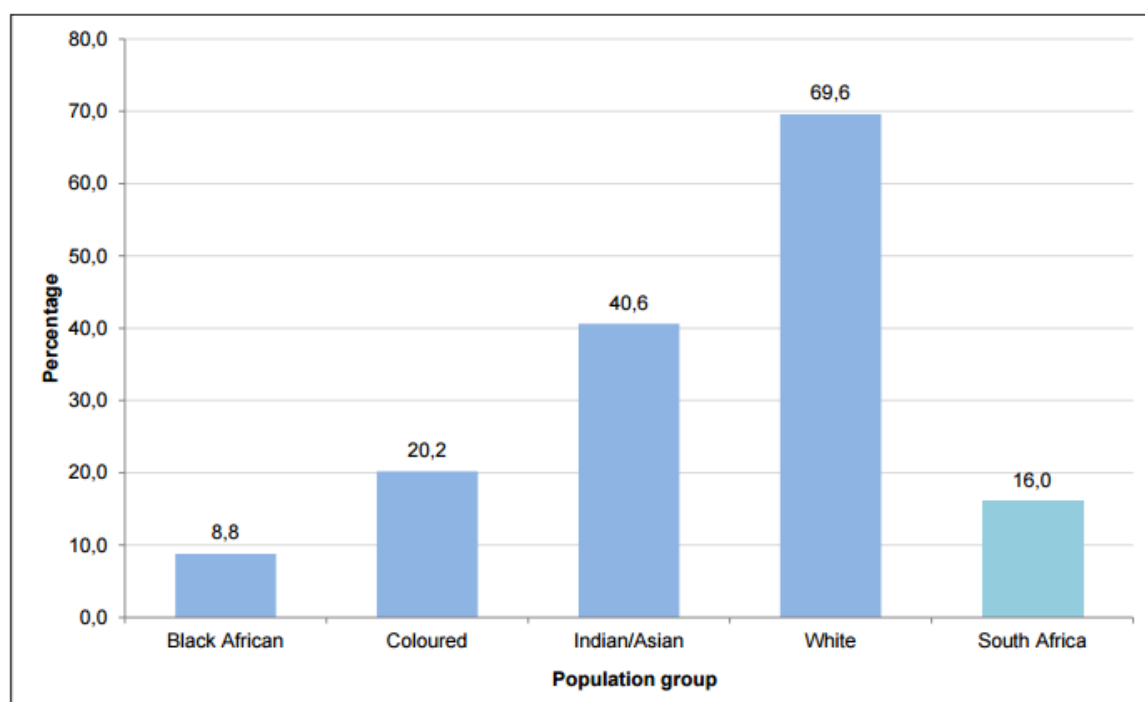
A disparity is clearly evident between health facility used and population group. The Government report explains the preference for private health institutions by long waiting times and unavailability of drugs needed

Table 3 Percentage distribution of households by the time taken to reach the health facility normally used, when using their usual means of transport, classified by population group

Characteristics	Time taken					Total
	Less than 15 minutes	15 - 29 minutes	30 - 89 minutes	90 minutes and more	Do not know	
South Africa	39,3	41,5	17,0	2,1	0,1	100,0
Population group						
Black African	33,6	43,7	20,1	2,5	0,1	100,0
Coloured	56,0	35,1	7,8	1,2	0,0	100,0
Indian/Asian	60,5	35,0	4,5	0,0	0,0	100,0
White	61,9	32,4	4,9	0,5	0,2	100,0

A disparity is also observed amongst population groups concerning coverage by medical aid or medical benefit scheme or other private health insurance, as depicted in Figure 4. National Health Insurance (NHI) is proposed as a solution for South Africa and envisages ensuring universal health coverage for all South Africans and improving the quality of health care services irrespective of socio-economic status of the user, amongst other objectives [11]. The implementation of NHI needs serious consideration in the development of systems of care for South Africa.

Figure 4 Percentage distribution of the population covered by medical aid or medical benefit scheme or other private health insurance, classified by population group



Treatment goals of having diagnosis of STEMI being established by ECG within 10 min of first medical contact (FMC) and having fibrinolytics being administered within 30 min of FMC) could potentially be adhered to for approximately 80% of the population if appropriate systems of care are in place and treatment guidelines are adhered to. The most recent report from a study performed at a public academic hospital in Pretoria [7] in 2015 states that “Only 37% of patients received fibrinolytic therapy and only 3% received the medication within 1 hour” [7]. Similarly 44,7% STEMI cases reportedly received fibrinolytic therapy at the Grootte Schuur Hospital in Cape Town (2012) [8] and 36% of South African STEMI cases captured in the ACCESS registry (2007-2008) received fibrinolytic therapy [9].

Analysis of SA Heart ACS Registry data for 2004-2012 (unpublished findings) with the aim of improving management of STEMI in South Africa shows that:

- Family history of heart disease and diabetes highest in Indian males (59% and 39%), and hypertension in African ancestry males (72%).
- More patients were diagnosed with STEMI in public versus private centres (15 vs. 7%) 2010-2012.

The frequency distribution of the 5747 patients across ACS-diagnosis types for the different race groups is reported in Table 4

Ethnicity	(n)	STEMI	Stable Angina	Unstable Angina / Non-STEMI
African ancestry	334	18%	50%	32%
Caucasian	4378	7%	59%	34%
Mixed Ancestry	320	12%	46%	42%
Indian	715	11%	56%	3%

Base-line data for the SAHA/SASCI STEMI Early Reperfusion Project was sources in a small pilot study undertaken in the Tshwane Metropolis (May - October 2012) to establish time intervals along the referral pathways from onset of symptoms to percutaneous coronary intervention [10]. System delays were evident with inter-facility transport (IFT) compared with direct access (DA) to a PCI facility (median 3.7 vs. 30.4 hours; $p < 0.001$). Door-to-balloon times of ≤ 90 minutes were achieved in a mere 22% DA and 33% IFT patients, and fibrinolysis within ≤ 30 minutes was only achieved in 50% DA and 20% IFT patients. A research project: ‘Delays in early reperfusion for ST-segment-elevation myocardial infarction – an observational study in South African hospitals’, has been launched late in 2015 to measure and monitor effect of education and other strategic interventions that are to follow.

Objectives for SFL South Africa

With the guidance of SFL Europe SFL South Africa proposes to improve the management of STEMI cases in accordance with defined objectives and through the implementing of action plans listed in Table 5. Achievements to date are represented in Table 6.

We would like to express our sincere appreciation to SFL Europe and The European Association of Percutaneous Cardiovascular Interventions for their support and guidance. Contributions and support from other SFL countries and from our industry partners and friends are gracefully acknowledged.

Table 5 SFL South Africa Objectives and action plans

Country Objectives

Recruitment of cardiologist in regions across South-Africa

- to organize education meetings for HCP on the management of STEMI, ACS and other chest pain syndromes across all provinces;
- to drive the educational project, to develop regional networks and solutions; and
- to contribute towards registries for measurement and monitoring of the impact of education initiatives and other strategic interventions.

Collaboration with countries with similar needs to learn from them and share our experiences with them.

Establishment of a network amongst STEMI care providers (public and private), central and local government, medical insurance companies and private sector funders;

Deployment of central and regional public awareness programs and establishment of institutional / other patient education strategies with the aid of other existing organizations (Heart and Stroke Foundation).

Country key plans

- Establish a representative steering committee – preferably at national level - with Government support;
- Set up task groups for each objective and define action plans with key account holders and quality indicators;
- Education workshops to be presented in all provinces;
- Improve partnerships with other bodies that educate at-risk patients / run campaigns;
- Source information on STEMI prevalence and patient outcome in all regions;
- Map facilities' capabilities to diagnose and treat STEMI (Clinics / Hospitals, HCW, etc) and identify needs in remote areas;
- 'Delays in early reperfusion for STEMI' project to be operationalized in at least one region per province;
- Evaluate software solutions for data collection and IT supported patient management;
- Revise STEMI workbook and distributed nationally;
- Develop SA SFL Web-page and regularly update SA Heart STEMI webpage; and
- Invite industry partners and medical funders to contribute to planning and development.

Table 6 SFL South Africa achievements to date

- Education workshops for Health care providers since 2011
- Establishment of a core team to drive and manage the project
- Commencement of the 'Delays in early reperfusion for STEMI – an observational study in South African hospitals' project – 30 patients enrolled to date
- Collaboration electronic data capturing and IT supported patient management
- Regional (Pretoria) implementation of the Hub-and-spokes model
- Contact established with EMS
- Preliminary contact established with National Government
- Scientific outputs to increase awareness of STEMI management and report base-line data on systems of care for patient management.



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