SPECIAL REPORT

Health and Health Care in South Africa — 20 Years after Mandela

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In the 20 years since South Africa underwent a peaceful transition from apartheid to a constitutional democracy, considerable social progress has been made toward reversing the discriminatory practices that pervaded all aspects of life before 1994.[1-5] Yet the health and well-being of most South Africans remain plagued by a relentless burden of infectious and noncommunicable diseases, persisting social disparities, and inadequate human resources to provide care for a growing population with a rising tide of refugees and economic migrants.[4,6] Appropriate responses to South African health care challenges would be to address the social determinants of health (which lie outside the health system) as a national priority, strengthen the health care system, and facilitate universal coverage for health care.

Reflection on some major health challenges and recent trends in health, wealth, health care, and health care personnel provides glimpses into future prospects. It is acknowledged that although there are unique aspects to improving health in South Africa, the local challenges represent a microcosm of impediments to improving population health globally.[7] Reversing the adverse health effects of complex, interacting local and global causal factors will be immensely difficult and will take many decades,[6,8-10] especially in a world facing profound challenges since the 2008 global economic crisis.[11]

MAJOR NATIONAL HEALTH CHALLENGES

HEALTH AND POVERTY

Health should be considered within the broader context of direct and indirect links between wealth and health, although these relationships are complex. When extreme poverty affects a large proportion of the population, as in South Africa, health is predominantly affected by a lack of access to the basic requirements for life — clean water, adequate nutrition, effective sanitation, reasonable housing conditions, access to vaccinations, good schooling, and the childhood and adolescent nurturing that, with the availability of jobs, set the scene for improved health and longevity. At less severe levels of poverty, improved access to basic and then more sophisticated health care adds to the prospect of healthier lives.

Both absolute and relative poverty are relevant. In societies with less relative poverty (as indicated by a lower Gini coefficient of income inequality [ranging from 0 to 1, with 0 indicating total equality and 1 indicating maximal inequality]), disparities in health and well-being are less marked.[12] Relative and absolute poverty in South Africa share common causes and manifestations with poverty globally.[13,14]

Beyond the elimination of legislated racial policies, advances in South Africa during the past 20 years include substantial economic growth, an expansion of the black African middle class, and a greatly increased number of social grants to the very poorest and unemployed.[5] (The term "black African" refers to indigenous people who speak an African language.) Social grants have reduced absolute poverty, but 45% of the population still lives on approximately $2 per day (the upper limit for the definition of poverty). More than 10 million people live on less than $1 per day — the so-called food poverty line below which people are unable to purchase enough food for an adequate diet. Even at an income of $4 per day, the quality of life would not be remotely near the level that the majority of South Africans had hoped for after the end of apartheid. Relative poverty has become worse, with the Gini coefficient increasing from 0.6 in 1995 to almost 0.7 in 2009.[15] The top 10% of South Africans earn 58% of the total annual national income, whereas the bottom 70% combined earn a mere 17%.[16] These disparities, the widest in the world, are associated with diseases of poverty (see below). The persistence of such

disparities is incompatible with improvements in population health.

HIV/AIDS PANDEMIC AND LOCAL RESPONSES

South Africa, with 0.7% of the world's population, accounts for 17% of the global burden of human immunodeficiency virus (HIV) infection.[17] The devastating effects of the pandemic on the lives of individuals, families, whole population groups, and society in general has received special attention.[4,18,19]

In 2003, after much government denial and an abysmally slow response with regard to funding for HIV and the acquired immunodeficiency syndrome (AIDS), considerable local and international pressure resulted in the government introducing an ambitious program to provide antiretroviral therapy (ART) to all patients with HIV infection.[20] Spending on HIV increased at an average annual rate of 48.2% between 1999 and 2005. The level of growth was consistently higher than that in other areas of national health expenditure and has continued at an annual rate of approximately 25%, with dedicated HIV funding estimated at $400 million (in U.S. dollars) per annum, of which approximately 40% comes from international donors. Of 6 million HIV-positive South Africans, more than 2 million receive ART.[6]

The U.S. President's Emergency Plan for AIDS Relief, which has saved the lives of millions of people in South Africa, is now being reconsidered and scaled back, with potentially adverse effects on the lives of many who could benefit greatly.[21] Prevention is widely accepted as the most cost-effective strategy to curtail the epidemic, yet a mere 11% ($695 million in U.S. dollars) of the planned expenditure on HIV from 2011 to 2016 is allocated to prevention.[22] The 2003, 2007, and 2011 national plans for HIV, with funding increasingly skewed toward HIV treatment, have implications for a deteriorating national public health system committed to equitably serving all South Africans.[17,22]

TUBERCULOSIS

South Africa has one of the worst tuberculosis epidemics in the world. Driven in recent decades by the spread of HIV infection, the incidence of tuberculosis increased from 300 per 100,000 people in the early 1990s to more than 600 per 100,000 in the early 2000s and to more than 950 per 100,000 in 2012. Despite notable progress in improving treatment outcomes for new smear-positive tuberculosis cases, the tuberculosis burden remains enormous.[23] Multidrug-resistant (MDR) tuberculosis accounts for 1.8% of all new cases of tuberculosis (95% confidence interval [CI], 1.4 to 2.3) and 6.7% of retreatment cases (95% CI, 5.4 to 8.2).[24] Since a study involving patients with extensively drug-resistant (XDR) tuberculosis in rural South Africa made international headlines,[25] South Africa reports the most XDR tuberculosis cases in the world. Annual notifications increased from 298 in 2005 to 1545 in 2012 (Fig. 1).[24] Approximately 10% of MDR tuberculosis cases reported in South Africa are XDR tuberculosis cases.[24]

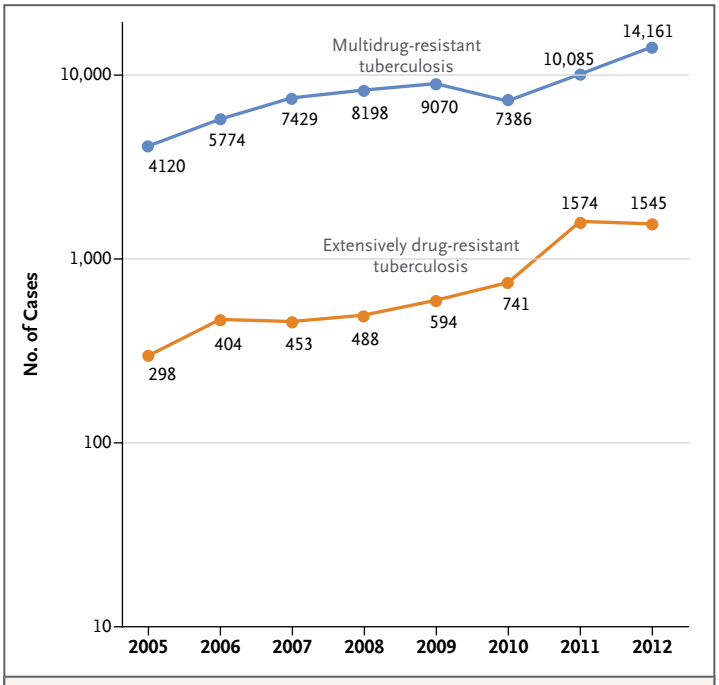

Figure 1. Cases of Multidrug-Resistant Tuberculosis and Extensively Drug-Resistant Tuberculosis in South Africa, 2005–2012.
Data are from the World Health Organization.[24]

WIDENING DISPARITIES IN HEALTH CARE

Annual per capita expenditure on health ranges from $1,400 in the private sector to approximately $140 in the public sector, and disparities in the provision of health care continue to widen.[3] The national public health sector, staffed by some 30% of the doctors in the country, remains the sole provider of health care for more than 40 million people who are uninsured and who constitute approximately 84% of the national popu-

Table 1. Trends in Life Expectancy at Birth and in Mortality.

Variable	1995	2005	2012
Life expectancy at birth (yr)	63	54	60
Neonatal deaths per 1000 live births (no.)	19	18	15
Infant deaths per 1000 live births (no.)	46	51	15
Deaths in children <5 yr of age per 1000 live births (no.)	60	70	45

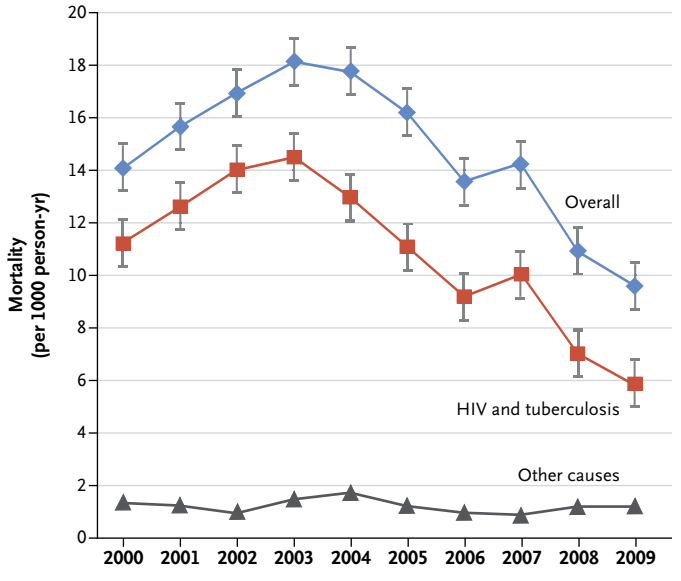

Figure 2. All-Cause and Cause-Specific Mortality among Women 15 to 49 Years of Age, 2000–2009.
Data are from Nabukalu et al.[31]

lation. Approximately 16% of South Africans (8 million people) have private health insurance that provides access to health care from the remaining 70% of doctors who work full-time in the private sector. Up to 25% of uninsured people pay out of pocket for private-sector care. In recent years, permission for senior full-time staff in the public sector to spend a limited proportion of their time working in the private sector has diluted their public-service activities.

Many of the state hospitals are in a state of crisis,[26] with much of the public health care infrastructure run down and dysfunctional as a result of underfunding, mismanagement, and neglect. This has been most visible in the Eastern Cape province[27] but is also striking in other regions.[3,6]

HEALTH TRENDS

MATERNAL AND CHILD MORTALITY AND LIFE EXPECTANCY AT BIRTH

Neonatal mortality, infant mortality, and mortality among children younger than 5 years of age have decreased (Table 1),[28] despite adverse changes in the pre-2005 period exacerbated by the AIDS denialism of the government led by President Thabo Mbeki. Approximately 330,000 lives or 2.2 million person-years were lost owing to the failure to implement a feasible and timely ART program.[29]

Reported trends in maternal mortality vary widely. Maternal deaths per 100,000 pregnancies increased from 150 in 1998 to 650 in 2007,[30] but other findings suggest that there has also been improvement toward the achievement of Millennium Development Goals.[6] Many maternal deaths in South Africa are related to HIV infection.[31] Although the combination of HIV and tuberculosis is the leading cause of death among women of reproductive age in KwaZulu-Natal province, death rates have declined since the launch of the ART program in 2003 (Fig. 2).[31]

Estimates of life expectancy at birth in the general population increased from 54 years in 2005 to 60 years in 2012 (Table 1).[32] This improvement was due to sustained decreases in mortality among young adults and children, largely because of the rollout of the ART program and prevention of mother-to-child transmission of HIV. HIV-positive adults in South Africa have a near-normal life expectancy, provided that they start ART before their CD4 count drops below 200 cells per cubic millimeter.[33]

CHANGING PATTERNS OF DISEASE

The Global Burden of Disease Study has highlighted three major aspects of the changing burden of disease in South Africa during the past 20

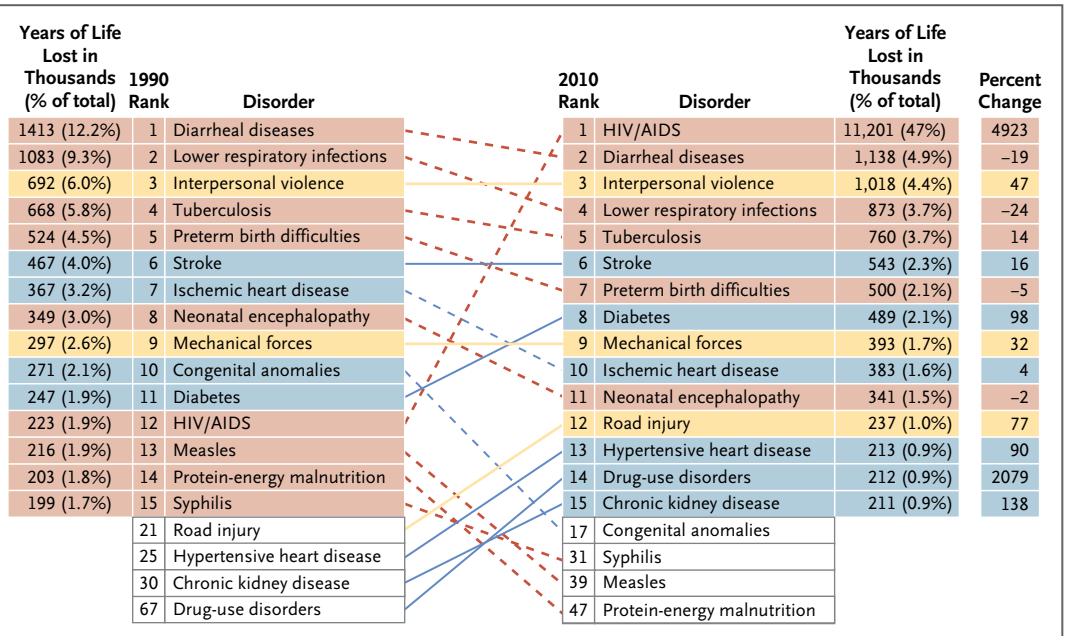

Figure 3. Causes of Premature Death in 1990 and 2010 in South Africa.

Years of life lost is an estimate of the average number of years that a person would have lived if he or she had not died prematurely. Pink shading indicates infections and neonatal and childhood disorders; yellow shading, violence and injury; and blue shading, noncommunicable diseases. Mechanical forces refers to forms of injury other than interpersonal violence and road injury. Data are from the Institute of Health Metrics and Evaluation.[34]

years.[34] First, there has been a marked change in causes of premature death, with HIV/AIDS rising to the top coupled with the increasing contribution of violence, injuries, diabetes, and other noncommunicable diseases (Fig. 3). The highest proportion of disability-adjusted life-years lost is attributable to alcohol use, a high body-mass index, and high blood pressure, if unsafe sex is not taken into account as a separate risk factor (Fig. 4). Second, South Africa continues to stack up poorly against other middle-income countries with regard to age-adjusted death rate, years of life lost from premature death, years lived with disability, and life expectancy at birth (Table 2). Finally, noncommunicable diseases are emerging in both rural and urban areas, most prominently among poor people living in urban settings. This rising burden, together with demographic changes leading to an increase in the proportion of people older than 65 years of age, contributes to increasing pressure on short-term and long-term health care services.[35,36] The burden of noncommunicable diseases will probably increase further as ART further reduces mortality from HIV/AIDS.

HUMAN RESOURCES AND THE HEALTH SYSTEM

MEDICAL STUDENTS AND GRADUATING DOCTORS

The number of new medical students enrolling annually increased by 34% between 2000 and 2012, a period characterized by a major and deliberate demographic shift toward more black African and female enrollees.[37] These patterns have been influenced by controversial affirmative-action policies that allow students from previously disadvantaged groups to be admitted with lower entrance scores.[38] A new national scheme has been initiated for training physician scientists through an M.B., Ch.B./Ph.D. program in an attempt to sustain academic medicine (located in the public health sector) in the future.[39] Government interest in funding medical research will hopefully support this goal.[40-42]

The number of graduating doctors increased by 18% between 2000 and 2012, with a shift from gender parity to more women, more black Africans and persons of mixed ancestry, and fewer whites and Indians (Table 3).[43] However,

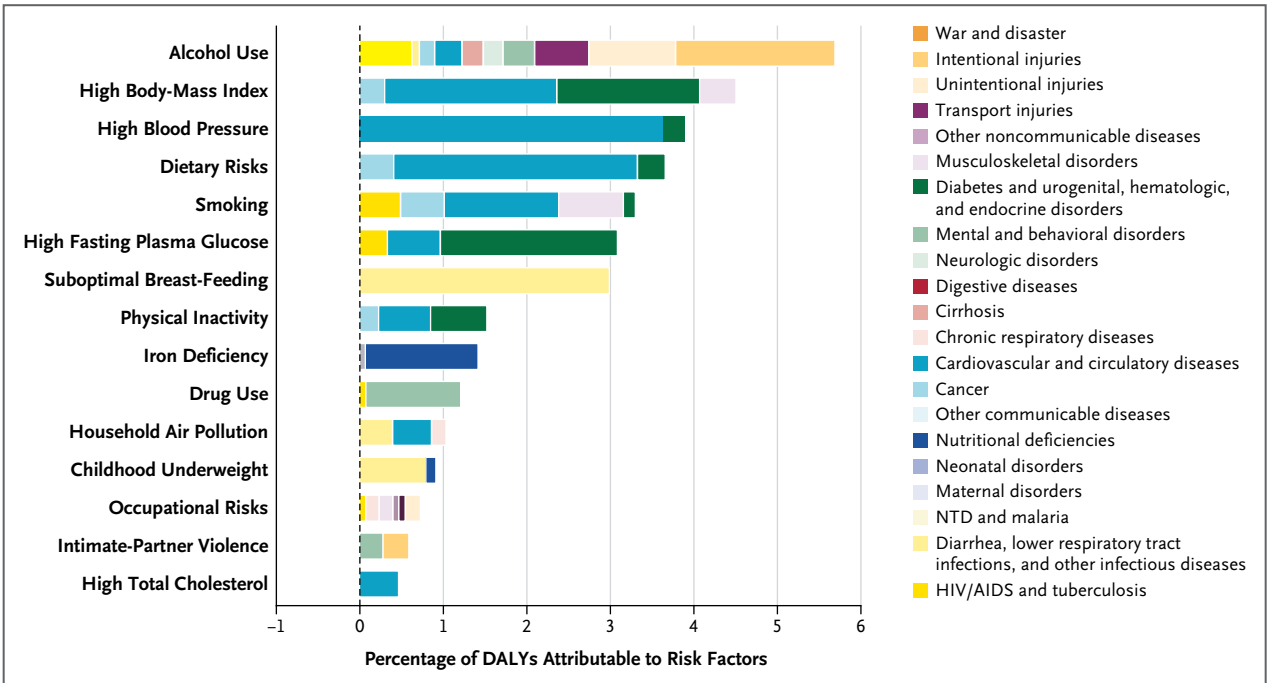

Figure 4. Burden of Disease Attributable to the 15 Leading Risk Factors in South Africa, 2010.

The disability-adjusted life-year (DALY) is a measure of overall disease burden, expressed as the number of years lost owing to ill health, disability, or early death. NTD denotes neglected tropical diseases. Data are from the Institute of Health Metrics and Evaluation.[34]

the ratio of physicians per 1000 population, which was essentially unchanged between 2004 (0.77) and 2011 (0.76), is failing to keep up with population growth.[44] Similar countries such as Brazil (1.76 in 2008), Russia (4.31 in 2006), and China (1.46 in 2010) are doing better than South Africa, whereas India (0.65 in 2009) is not doing as well.[44]

A program initiated by President Nelson Mandela in the mid-1990s to train medical doctors in Cuba was intended to promote a local version of the much-admired Cuban orientation toward primary health care. Participating doctors are mainly black Africans from rural areas. The program will expand by a factor of nearly 10 over a 5-year period, with the goal of introducing 1000 graduates annually into the health system from 2018 onward.[45] The wisdom of training nearly half of South Africa's doctors in another country has been questioned, given that the local tradition and capacity for a primary health care approach[46] buttressed by well-spent resources could be used to strengthen existing medical schools and establish new training facilities.

NURSES AND COMMUNITY HEALTH WORKERS

Nurses have long been central to health care, especially in rural areas where physicians are reluctant to practice. Between 2003 and 2012, the total number of nurses in all categories on the Nursing Register increased by more than 40%.[47] Although many registered nurses may not be practicing and there may be a shortage of qualified nurses, the growth rate has greatly exceeded population growth (the population increased 14% from 2003 [46.4 million] to mid-2013 [53.0 million]).[48] Community health workers are recognized as a means of improving access to health care and encouraging community participation in health care in periurban and rural areas. Most are employed by nonprofit organizations.[49]

IMMIGRATION AND EMIGRATION OF HEALTH PROFESSIONALS

South Africa and eight other sub-Saharan African countries have lost more than $2 billion (in U.S. dollars) in investment from the emigration of domestically trained doctors to Australia, Canada, the United Kingdom, and the United States.[50] South Africa incurs the highest costs for medical

education and the greatest lost returns on investment for all doctors currently working in such destination countries. Previous studies indicate that up to 30% of South African doctors have emigrated and that 58% were intending to emigrate to Western countries.[51] Immigration of doctors increased from 239 in 2003 to a peak of 427 in 2006, but this was followed by a rapid decline to only 10 registrations in 2013, owing to stringent registration requirements introduced by the Health Professions Council of South Africa.[43]

PROSPECTS FOR NATIONAL HEALTH INSURANCE

Working toward the goal of national health insurance to provide more equitable access to high-quality individual health services has reemerged as a popular notion,[6] and a draft plan has been developed.[52] Health economists have suggested that it would be feasible to raise the additional required funding.[53] However, expectations that equity in health care delivery could be achieved at levels close to current private-sector levels appear to be unrealistic. It is clear from the disparities in funding of the private and public sectors and the very large number of additional health care professionals required that this is unlikely and, if achievable, would take a very long time.[8] Creating a National Health Service would be an even greater challenge.[6]

IMPROVING ACCESS TO HEALTH CARE

Concerted action will be needed to strengthen the district-based primary health care system, to integrate the care of chronic diseases and management of risk factors and to develop a national surveillance system with the goal of applying well-managed and cost-effective interventions in the primary and secondary prevention of disease within whole populations. South Africa requires at least three times its current health workforce to provide adequate care for patients with HIV/AIDS.[54] The recent thrust toward training more community health workers and the successful development of front-line worker–based programs to control tuberculosis and HIV infection offers considerable promise.[55]

Increasing the number of health care professionals and reshaping health services pose major challenges. The wide gap between planning new training schools and making these functional will not be easily traversed.[49] One of the first priorities must be to resuscitate and strengthen

Table 2. Burden of Disease in Seven Middle-Income Countries.*

Country	Age-Standardized Death Rate				Age-Standardized Rate of Years of Life Lost†				Age-Standardized Rate of Years Lived with Disability				Life Expectancy at Birth			
	1990		2010		1990		2010		1990		2010		1990		2010	
	rate per 100,000	*rank*	*rate per 100,000*	*rank*	*rate per 100,000*	*rank*	*rate per 100,000*	*rank*	*rate per 100,000*	*rank*	*rate per 100,000*	*rank*	*yr*	*rank*	*yr*	*rank*
Costa Rica	556	1	462	1	13,705	1	10,447	1	11,672	2	10,948	1	76.6	1	79.4	1
Jamaica	676	2	610	2	18,618	2	16,417	3	12,075	5	12,909	6	73.6	2	75.3	2
Brazil	854	3	670	4	26,370	4	17,580	5	12,016	4	11,637	4	69.1	4	74.1	4
Romania	895	4	712	5	23,494	3	16,325	2	11,261	1	11,043	2	69.9	3	73.8	5
Iran	943	5	640	3	29,033	5	16,780	4	13,288	7	12,619	5	67.5	5	74.4	3
Kazakhstan	1043	6	1043	6	31,524	6	29,881	6	11,955	3	11,587	3	66.2	6	66.7	6
South Africa	1133	7	1266	7	34,540	7	48,286	7	12,905	6	13,826	7	64.6	7	59.9	7

* Data are from the Institute of Health Metrics and Evaluation.[34]
† Years of life lost is an estimate of the average number of years that a person would have lived if he or she had not died prematurely.

Table 3. Trends with Regard to Medical Students, Graduating Doctors, and Nurses.*

Variable	2000	2012	Percent Change
Medical students			
No. per year	1114	1491	34
Sex			
Female — no.	627	906	44
Male — no.	487	575	18
Female-to-male ratio	1.3:1	1.6:1	
Race — % of students			
Black African	34	47	
White	37	28	
Graduating doctors			
No. per year	1131	1335	18
Sex			
Female — no.	554	773	40
Male — no.	557	562	<1
Female-to-male ratio	1:1	1.4:1	
Race or ethnic group			
Black African†	293	590	101
Mixed ancestry	53	106	100
White	566	455	–20
Indian	219	182	–17
Nurses			
Included on the Nursing Register — no.	177, 721‡	248,736	40

* In 2011, there were 162,630 health professionals registered with the Health Professions Council of South Africa in several professional categories. In addition, there were 12,813 pharmacists and 9071 pharmacist assistants registered with the Pharmacy Council in 2010. Of approximately 65,000 community health workers in 2011, 47,121 were home-based or community-based care providers, 9243 were lay counselors, 2040 were directly observed treatment supporters, 2010 were adherence counselors, and 1810 were peer educators.

† Black African refers to indigenous people who speak an African language.

‡ Data are from 2003.

existing facilities and to strive for high-quality teaching, conditions of service, and an ethos of care in clinical services (at all levels)[2,8] that, in synergy, could foster the dedication of health care professionals to provide services with excellence, rather than merely seek the security of a job and a salary.[56,57] Previously expressed concern that cutbacks in tertiary medicine in the public sector would hinder postgraduate training remains relevant.[2]

Given the different strengths and weaknesses of the public and private health care sectors, any strategic alliances forged with the private sector to improve health care services in the public sector will have to be mutually agreeable while biased toward strengthening the public sector in the national interest. The Department of Health of the Western Cape province has set an example.[58] Operationalizing such ambitious plans will be extraordinarily challenging and is likely to take many decades.

ECONOMIC AND POLITICAL FACTORS

HEALTH IMPROVEMENT AND POVERTY ALLEVIATION

Although the economic policies of South Africa have not been explicitly articulated, trends in disparities in health and wealth in part reflect the outcome of policies adopted by successive governments in the new South Africa.[10] These have shifted from the progressive idea of growth through redistribution, as envisaged in the Reconstruction and Development Program of the Mandela government in the early 1990s that was intended to narrow the apartheid legacy of economic disparities, to growth and redistribution within the subsequent conservative Growth, Employment, and Redistribution strategy in line with neoliberal economic policies that were favored by President Mbeki.[10] His policies facilitated economic growth, reduced expenditure on debt servicing and health care,[2] and enabled the growth of a black African middle class.[10]

However, despite a reduction in absolute poverty through social grants and a larger middle class that has substantially changed the overall distribution of income, these financial gains came at the expense of increased levels of inequality.[5] The rate of unemployment, defined narrowly by the active seeking of work, has remained at 20 to 24% since 1994, with 70% of the unemployed younger than 34 years of age. In the late 2000s, 23% of South Africans lived below the food poverty line, but 54% faced food insecurity.[59]

The trajectory from the socialistic economic policies of the Mandela government through the neoliberal policies propagated under Mbeki's much-criticized leadership has been interpreted as a betrayal of the vision of a new, caring, cosmopolitan social democracy. Hence we have witnessed a shift toward neo-Keynesian policies associated with support from the Congress of South

African Trade Unions and the South African Communist Party for the Jacob Zuma takeover and for the New Growth Path that sets the target of narrowing economic disparities.[10]

SOCIAL AND POLITICAL FAILURES

Regrettably, many South Africans, including those in leadership positions, have been co-opted into the lavish lifestyles, wasteful consumption patterns, and nepotism that frustrate the ethos required to reduce inequities. Many, including long-standing members of the African National Congress (ANC), agree that corruption is at the root of the moral decay in South Africa. Other failings include attacks on liberal aspects of the constitution, interference with the independence of judges, corruption of the criminal justice system, and infringement of rights to government information.[9,60-62] Widespread dissatisfaction with the ANC is reflected in the results of the 2014 elections, in which only 59.3% of eligible voters participated (as compared with 85.5% in 1994) and the ANC garnered 36.4% of eligible votes (as compared with 53.0% in 1994).[63]

Since the onset of the 2008 global economic crisis, it is becoming more widely acknowledged that efforts to address many critical local and global problems are dominated by a misguided, inadequate development ideology and agenda.[11,64] Although global institutional efforts have been stepped up in support of the international development targets, current economic trends globally and in South Africa are preserving privilege for a minority of people (about 20% of the world population and 30% of South Africans) while simultaneously intensifying inequality, poverty, starvation, violence, and abuse of our environment.

CONCLUSIONS

Much of the hope for narrowing disparities in the new South Africa was embedded in the reversal of legislated racial discrimination generally and in aspirations for more equitable provision of health care specifically. But this places too much emphasis on legislation and biomedicine as the dominant routes to improved health, without consideration of the social determinants of health and the complexity associated with the effective practical application of new laws and health services.

The long-term challenges in South Africa are to narrow disparities in wealth, health, and education and to generate opportunities for many more people to survive childhood, reach their full human potential, and lead healthy, productive lives. In the medium term, improving access to sustainable and effective health care services is a high priority.[6] Short-term measures should include strengthening public health care services, improving resource-allocation policies, and training an appropriate balance of health care professionals. Nurses and community health workers will probably play an increasingly important role in rural areas.

Efforts to achieve sustainable improvements in health with limited resources and much reduced prospects for economic growth call for improved health care management and governance and widespread shifts in attitude to "doing better with less." Sustaining the ambitious national shift into a new paradigm arguably requires that other countries also make major shifts in their policies and expectations to facilitate survival on a planet with increasing constraints on natural resources and many threats to a now fragile ecologic environment.[7]

Such complex (perhaps even intractable) local and global problems require transdisciplinary sociopolitical–economic research projects that could reframe the nature of progress and perspectives of ourselves as local and global citizens.[65,66] The magnitude of this task is arguably as daunting as the task of producing an HIV vaccine.

At a time characterized by local and global crises that engender much despondency, and when it seems that we are probably collectively unable to recognize the dire nature of our mutual predicament,[67] it is appropriate to recollect how President Nelson Mandela's attitude of magnanimity and reconciliation (despite 27 years in prison) spearheaded peaceful progress toward a new South Africa. His example continues to be an inspiration to many in South Africa and beyond, as reflected in the affection, admiration, and awe in which he is so widely held.[68]

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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