OPINION ARTICLE

The Doctor of the Future

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Should doctors of the future continue to interact occasionally with the patient in their offices, or should they be part of a healthcare team responsible for the community, with the continuity and health promotion in their homes?

INTRODUCTION

Fewer and fewer people believe that medical progress depends entirely on technological innovations, when at the same time current worldwide healthcare —with different nuances— is fragmented, without continuous care physicians who thoroughly know their patients, and are ultimately responsible for making decisions about their health. However, Hunter has recently stated that "*As studies have shown, most patients and the public didn't really want choice—rather, they wanted accessible services provided locally where possible that they could trust and which were safe and of good quality.*" (1)

This leads us to ask ourselves: What are the factors for poor health in today's society?

In A New Engl J Med Perspective on the role of clinicians in health care reform, Darzi writes: "*Lifestyle-related health problems, like obesity, smoking, or diabetes, will not be solved by high-tech robotics and larger hospitals, but rather by access to family doctors, innovations in public health, and lessons from the emerging discipline of behavioral economics.*

The best results can be achieved only when the system itself is healthy and based on true "partnership" between patients and clinicians". (2)

Instead, …."*it is called for "partnership" with the private sector, notwithstanding the mounting evidence of the commercial determinants of ill-health such as alcohol, tobacco, ultra-processed foods, and industrial and automobile pollution*", (3) and we could add the catastrophic climate change due to global warming from non-renewable fossil energy industries.

These commercial determinants are not due to small businesses or even national companies, but to the fact that "*The power of transnational corporations, the main vectors of the commercial determinants of health, transcends national boundaries and requires strong and decisive global action both by global civil society and international institutions. In 2018, for example, of the 100 entities with the highest annual revenues, 69 were corporations and 31 were governments*". (3)

Therefore, as has been well stated: "*Most noncommunicable diseases require a personal as well as a population approach to affecting risk-enhancing lifestyles and customs. This is a core component of primary health care*". (4)

However, health risks are different, and can actually vary in the different communities. Therefore, the first essential step is to identify the risk determinants in the communities where we work, in order to adapt health care to the specific requirements of our population and monitor the outcomes.

We will attempt to demonstrate that some populations are "invisible" to their specific determinants.

"INVISIBLE" RISK FACTORS IN INFORMAL SETTLEMENTS

Argentina in general (5) and the City of Buenos Aires in particular (6) are contexts with profound health inequalities. Likelihood of premature death —dying before the age of 74— is determined by socioeconomic factors. In the highest quintile of unmet basic needs, total mortality increases by > 30% and cardiovascular mortality by > 33% in Argentina as a whole; and the difference is even more significant in the capital city, with more than double the number of deaths. (5-7)

This fact is also confirmed and repeatedly published internationally. (8-10) Therefore, health policy planning for disease prevention requires proper data availability on disease burden and risks in the population. In Argentina, National Survey of Risk Factors (NSRF) has been carried out to identify the distribution of risk factors in large population groups.

However, huge social groups are left out of those estimates, because surveys of the so-called "unsafe areas", or dismissively referred to as "marginal areas" —which technicians aseptically call "informal settlements" and people accurately call "slums"—, representing about 10% of the inhabitants of Argentina, are excluded.

The purpose of our survey was to characterize the prevalence of risk determinants among the inhabitants of the slum "Villa 31", in Retiro neighborhood, Buenos Aires, and compare it with data from the NSRF. (11)

The Argentinian group of health users and workers, *Corriente Nacional de Salud Salvador Mazza*, together with the *Pichón Riviére School of Social Psychology,* conducted a baseline field survey of the Villa 31 and 31 bis in the City of Buenos Aires. During a period of 27 months, personal interviews were car-

ried out on Saturdays using the convenience sampling method to people living in different areas of Villa 31 and 31 bis slums in Retiro neighborhood, in the City of Buenos Aires (Survey of Villa 31, EV31). The interview was conducted on those who agreed to be surveyed. A probabilistic sampling was not carried out due to lack of housing map. The interviews were conducted using a structured questionnaire of more than 100 questions that included demography, employment, risk factors, addictions, and reproductive health. All participants had their blood pressure, weight and height measured. A total of 406 people were interviewed and their data were compared with data from 32,365 people in the NSRF. All comparisons were made on the basis of age group.

Demographics

The average age within each age group was similar between the NSRF and that of EV31. The proportion of women interviewed was significantly higher in Villa 31 (67.9% vs 52.6%). People from the slums tended to have less schooling; only 35% completed high school education compared with 51.9% in the NSRF.

As expected, housing characteristics were significantly different among the people in Villa 31 compared with NSRF, including flooring materials, proportion of lack of bathrooms or any other indicator of housing structure. The average number of family members was similar in EV31 and NSRF (almost 4).

People living in the slums lacked health insurance (mandatory or voluntary) in 78.3% of cases vs 29.1% in the NSRF. Unemployment rates were also significantly different between the two populations in all age groups: more than five times more common among people in the slums.

Declared health

Fair to poor self-rated health, the presence of pain and of moderate to severe anxiety and depression were significantly higher in all age groups of the slum residents (3 to 5 times). In addition, the prevalence of self-reported hypertension was higher among slum residents (26% higher), especially in young groups; for example, in people aged 25-34 years, it was almost 3 times higher. Prevalence of overweight (26%) and obesity (72%) was significantly higher for Villa 31 residents, especially among young people. The incidence of diabetes was 12.1% for EV31 and 9.8% for NSRF (26% more); however, this incidence was three times the national average among people aged 18 to 24. Compared to NSRF, Villa 31 residents were always significantly undertreated for all the conditions evaluated. That was the case with antihypertensive and lipid-lowering treatments, with 7 times more patients treated in the city, and with antidiabetic treatment, which increased 17 times.

The decrease in daily smokers was much more significant among people in Villa 31 (less than half) in all age groups. Daily alcohol consumption was 10 times more prevalent in the slums, with hazardous use in 35% and alcohol addiction in 10% of the residents. Illegal drug use was determined using validated Drug Abuse Screening Test-10 (DAST-10), showing hazardous use in 5% and addiction in 3%; but since all addicts were men, it rose to 13% in this group.

As evidenced, the prevalence of risk factors shows a particular distribution that differs from that reported in the NSRF of the city. Those data suggest the need to further survey these population groups to establish specific policies.

Comments

This huge conglomerate of people lives in extremely precarious housing in overcrowded conditions, and they are insufficiently represented in daily life and health planning. The NSRF, by sample design, represents 25.7 million Argentines living in cities. However, the inhabitants of the so-called *villas de emergencia* (slums) are not part of these represented Argentines, because slums have not been identified as distinct residential areas within the cities.

This is confirmed, because the number of people in the NSRF who lived in a location not suitable for housing or in a space of precarious structure represents only 0.5% of the sample.

Nevertheless, self-rated health —a deliberately, subjective, simply structured question— is a strong predictor of early mortality in the general population. (12) At any age, the perception of fair to poor health was two to three times more frequent among slum residents. This finding correlates with three times as many unemployed people as Argentinians who do not live in the slums, and most of them (75%) without health insurance (public or private health insurance plan) making this population dependent on public healthcare to find solutions to their many health problems.

In line with these findings are the high rates of depression and anxiety reported, as well as the greater presence of moderate to severe pain. The rate of hazardous alcohol use among slums residents is alarming (35%). Illegal drug consumption is a real problem, hazardous use 5%, with an addiction rate of 3% (13% in men).

A series of associated risk factors —especially among young people— cause deep concern. Both overweight and obesity double the national rates, and increase diabetes, cholesterol and hypertension. Despite these higher rates, the inhabitants of the slums had their blood glucose, cholesterol and blood pressure measured much less often in the last year; in addition, treatment rate among those with diabetes, hypercholesterolemia and hypertension was very low for all age groups, reaching up to 10 times less than in city residents of the NSRF.

The poor in general —and, in this case, the poorest of the poor— cannot choose freely what to eat or when to exercise. Claiming them a “lifestyle” with a

smart diet and exercise is simplistic, and places disease as the responsibility of the individual subject, rather than their "way of life" in which "smart" eating and exercising often require them time and money they do not have. In Argentina, the price of fruits and vegetables is often high, which explains their low consumption in the diet of slum residents. Moreover, the lower incidence of smoking among slum people may not be due to prudence or intelligent decisions, but rather to the cost of cigarettes, as is probably the case in the rest of the world. It is not enough to recommend prudence and hygiene: it is necessary to understand how to reach people who will have to make complex decisions in a unique environment full of challenges.

TRAINING FOR COMMUNITY SOCIAL WORKERS (CSWS) AND HOME CARE BY PRIMARY HEALTHCARE TEAMS

The availability of consultations for this population is affected by the few outpatient care centers with few health workers, and therefore limited opening hours, among other reasons. At the same time, preventing asymptomatic entities at an early age is not fostered in a population with vital urgencies, such as being unemployed and surviving its demographic indicators. Therefore, implementing a completely different healthcare system is mandatory.

With this idea in mind, we have concluded a first theoretical-practical course and evaluation to train "*community social workers*" *(CSWs) with the slum residents themselves*, for them to help and form a care team with primary care physicians and nurses that can address health risk factors and monitor treatment in the patient's own home, including scheduled and frequent visits to maintain continuity of treatment. COVID-19 pandemic prevented us from evaluating its effectiveness with a pragmatic controlled trial; we hope to carry it out in more favorable accessibility conditions.

EXPERIENCE IN OTHER LATIN AMERICAN COUNTRIES

A similar system, in which the same care team prioritizes the relationship with the community's public health, was systematically initiated in Costa Rica in 1994, when it passed unanimously in the Legislative Assembly. It would merge the public-health services of the Ministry of Health with the Caja's system of hospitals and clinics, and every Costa Rican would be assigned to a local primary-health-care team, called Basic Integrated Health Care Team (EBAIS, *Equipo Básico de Atención Integral en Salud*). This allowed public officials to combine living conditions and health needs as a whole, and to define and monitor the objectives to be achieved.

The EBAIS includes a physician, a nurse, and a trained community-health worker known as Technical Assistant in Primary Healthcare (ATAP, *Asistente Técnico en Atención Primaria*). An ATAPS is responsible for visiting 1400 homes preventively. The homes are grouped into three categories:

Priority 1 homes have an elderly person living alone or an individual with a severe disability, an uncontrolled chronic disease, or a high-risk condition; they average three preventive visits a year.

Priority 2 homes have occupants with more moderate risk and get two visits a year.

The rest are Priority 3 homes and get one visit a year.

The effectiveness of this system is evidenced in that Costa Rica's life expectancy became the longest in Latin America.

"*The results are enviable. Since the development of the EBAIS system, deaths from communicable diseases have fallen by ninety-four per cent, and decisive progress has been made against non-communicable diseases as well. It's not just that Costa Rica has surpassed America's life expectancy while spending less on health care as a percentage of income; it actually spends less than the world average. The biggest gain these days is in the middle years of life. For people between 15 and 60 years of age, the mortality rate in Costa Rica is 8.7 per cent, versus 11.2 per cent in the U.S.—a 30% difference. But older people do better, too: in Costa Rica, the average sixty-year-old survives another 24.2 years, compared with 23.6 years in the U.S.*" (13)

PEER SUPPORT GROUPS

In turn, taking advantage of the "neighborhood effect", peer support groups could be created for the management of different risk factors, guided by an ATAP to clarify doubts, but even more importantly, to demonstrate in concrete action how to exercise, quit smoking, reduce obesity, treat diabetes and hypertension, reduce alcoholism, and stop drug use. (14, 15)

The "neighborhood effect" was described by engineers Madiz and Risom, members of the Danish Gehl team, advising on the redevelopment of Villa 31. The interviewer says: "*The main surprise of the researchers was to detect that in Villa 31 streets there are a greater number of people walking, biking, socializing, playing and watching other people pass by than in the rest of the six neighborhoods they studied..., they state and assert that the families of Villa 31 deal with severe deprivation in many aspects, and yet, in the midst of scarcity, the neighborhood offers characteristics that some of the most privileged cities aspire to*." (16)

As shown, in the first place there is the invisibility of this population, since the distribution of medical conditions found in the "general population" cannot be automatically transferred to the population of the informal settlements of the City of Buenos Aires. Neither diabetes nor hypertension, depression or access to consultation and treatment are similar to those of "the city" residents. Therefore, the "city" health planning is not applicable to slum residents, since they are not part of the city as perceived by those who measure,

plan and execute. A policy that includes these subjects —their needs, perspectives, abilities and disabilities— is essential in implementing health policies.

Secondly, articulation of this health policy should be discussed. In the light of these results, the "passive offer" of services dealing with slum residents as mere "consumers" is far from a good approach.

As Tudor Hart put it in 1994, we should speak of patients not as clients but as collaborators or co-producers, together with the healthcare system: "*recognition of patients as co-producers rather than consumers would begin to solve several problems which are otherwise only likely to get worse. As co-producers, patients must share much more actively both in defining their problems and in devising feasible solutions than they have in the past.*" (1)

There is no place in co-production (citizens - group) for outmoded notions of professional dominance or paternalism, but instead a focus on combining the respective strengths of the public and professions.

Because it is not only about implementing a containment policy for "spontaneous demands" but about promoting "partnership" and "empowering" them to discuss how to promote and reverse a burden of disease and risk among the young population, who will have a significant number of events, suffering and disabilities in the near future. This enormous challenge demands an institutional, demographic and cultural revolution.

ECONOMY OF CHANGES IN RISK BEHAVIORS AND SOCIAL DETERMINANTS. DOES THE HEALTHCARE SYSTEM HAVE ANYTHING TO SAY TO STATE POLICIES?

Since 2015, the County Health Rankings (CHR) provides data for nearly every county in the U.S. on four modifiable groups of health factors, including healthy behaviors, clinical care, physical environment, and socioeconomic conditions, and on health outcomes such as length and quality of life. The relative contributions in the validated regression modeling for each of those determinants of health were 47% socioeconomic conditions, 34% healthy behaviors, 16% clinical care, and 3% physical environment.

The combination of socioeconomic conditions and healthy behavior account for 81% of life expectancy and quality of life, compared to a meager 16% for clinical care. Realizing the greatest improvements in population health will require addressing the social (healthy behaviors) and economic determinants of health. These are State Policies, in which those of us who provide clinical care decide on what to do and, most importantly, create a strong line of opinion in the population so that it can become a reality. (17)

Preventing ill health requires a focus on the behaviors that contribute most to chronic diseases, including smoking, unhealthy diets, alcohol consumption and physical inactivity, and which also follow a socioeconomic pattern.

Interventions to these risk factors —that largely target non-conscious processes— are those aimed at whole populations and include fiscal and economic interventions, marketing approaches, and interventions altering the availability of products that harm health.

As Marteau points out, "*Achieving effective policy action requires strong political and public support to overcome powerful lobbying from commercial organizations that profit at the expense of population health. Tackling behavioral and social causes together is particularly important for price based interventions.*" (18)

We will show the evidence for these policies.

School cafeterias: Availability is evidenced in purchases made in cafeterias by more than 20,000 children and adolescents from 54 private schools in Brazil. Only 11.6% of the products offered in the school cafeterias were of high nutritional value (HNV); an increase of one HNV beverage was associated with a 19% increase, but also with an 18% decrease in subsequent expenditure on low nutritional value (LNV) beverages. (19) In other words, improvements to menu quality have the potential to increase the consumption of healthier products and decrease the consumption of unhealthy ones.

Salt consumption: An excellent open-label, cluster-randomized trial involving persons from 600 villages in rural China (almost 21,000 subjects with a history of stroke and/or high blood pressure) was conducted in 3 different places in China. The intervention group used a salt substitute (sodium chloride 75% and potassium chloride 25%), while the control group continued to use regular salt, with a follow-up of 4.7 years, significantly decreased stroke (14%), major cardiovascular events (13%), and death (12%), with no adverse effects attributed to hyperkalemia. (20) Certainly, salt should have 25% potassium chloride to produce a decrease in the damage of cerebral and cardiovascular events in the overall population.

Alcohol: There is little evidence of a decrease in alcohol sales by setting a minimum price, except in Canada. In interrupted time series regression analyses of the impact of minimum unit pricing (MUP) on Scottish household purchases, with the 1 May 2018 imposition of a MUP of 0.64 pounds per gram of alcohol, there was an immediate decrease in weekly purchasing of 9.5 grams of alcohol per adult per household, almost half of the previous one. The reduction in purchased grams of alcohol was greater in lower income households and in those that purchased the greatest amount of alcohol. If this policy were widespread, it would reduce the seventh leading risk factor for ill health and premature death in the world. (21)

Smoking: Smoking tobacco use accounted for 7·69 million deaths per year (87% were smokers at that time) and 200 million disability-adjusted life-years. (22)

"*Price is the key determinant of smoking uptake and cessation. Worldwide, a reduction of about a third*

could be achieved by doubling the inflation-adjusted price of cigarettes, which in many low- and middle-income countries could be achieved by tripling the specific excise tax on tobacco. [...] Higher taxes are particularly effective in poorer or less educated groups, and help prevent young people who are experimenting with smoking from becoming regular smokers." (23)

Surprisingly —or not so—, excise tax is frankly lower in low- and middle-income countries than in high-income countries, preventing the decrease of tobacco consumption. The same effect of the price-consumption ratio is observed in Latin American countries. (24)

Sugary drinks: In a review of sugary drink consumption in children and adolescents, price increases are associated with a decrease in consumption. "*In the case of sugary drinks, a systematic review revealed that each 10% increase in price, such as a tax, reduced sugary drink consumption by 7%*." (25)

A study on price elasticity of sugary drinks in Mexico found that a 10% price increase was associated with a decrease in quantity consumed of soft drinks by 11.6% and 10.6% for sugar-sweetened beverages. Higher elasticities were found among households living in rural areas, in more marginalized areas and with lower income. (26)

In the Monthly Surveys of the Manufacturing Industry in Mexico from 2007 to 2015, an excise tax of 1 Mexican peso was implemented to sugary drink consumption, starting on January 1, 2014. The pre-tax period (2007-2014) was compared to the post-tax period (2014-2015), showing a 7.3% decline in sugary drink sales per capita, and a 5.2% increase in per capita sales of water, in that first year. (27) At 2-year follow-up, the decrease was 8.2% on average, being even greater in the second year. For taxed beverages, the three different income groups experienced significant declines but reductions in absolute and relative terms were larger among the lowest socioeconomic group. (28)

Childhood obesity: Childhood overweight and obesity have become such a serious problem in our society that a whole city is working against obesity in children, as is the case in Amsterdam, where trained volunteers visit schools, community centers and homes to to spread messages such as to drink water rather than sugary drinks, ban unhealthy food advertisements in subways, create an exercise-friendly city, and urge private business to promote healthy products (such as selling whole-grain bread instead of white bread). Community care nurses check weight and height of school children at least annually.

Childhood overweight decreased from 21% in 2012 to 18.5% in 2015 (12% drop, despite the increase in child population in those 3 years). (29)

A cluster randomized clinical trial was conducted in 24 schools in China. A total of 1392 children aged 8 to 10 years were allocated to multifaceted intervention, (targeting both the children and their environment —engaging the school and families in supporting children's behavioral changes, for one school year) or usual follow-up. Body Mass Index (BMI) decreased significantly by -0.46 kg/m2, as well as obesity by 27% and other common signs of adiposity, with no adverse events. (30)

Poor-quality diet: Adolescence is a pivotal point to induce healthy diets that can persist into later life. While there are still many countries with malnutrition or food insecurity, there is a rapid emergence of the obesity pandemic that occurs at that age.

"*A combination of taxes, regulation, and public education campaigns seems to maximize the impact. [...] Local governments can influence planning rules, such as restrictions on fast-food restaurants near schools* or *street food vendors licensing. For instance, exposure to fast food restaurants is strongly associated with junk food consumption, in a study on Canadian adolescents*." (31)

WHAT TO DO?

If agreement is reached on these proposals in a group discussion among health users and workers (*Corriente Nacional de Salud*), it would be necessary to move on to a concrete Health Program for each specific point. Different groups could deal with each topic; for example, how to set primary care groups, goals and forms of care developed together with the community, how to intervene in schools and train teachers, check weight and height of all school children more than once a year, what foods to ban or reduce availability with taxes —or facilitate their purchase with grants or tax abolition—, as well as other goals that may be set.

In a general meeting, each topic could be discussed and agreed upon, in order to achieve a specific and detailed Health Program; with the presentation and discussion of the entire population, it could have the required impetus to put it into practice.

CONCLUSION

William Beveridge, the economist whose 1942 report led to the founding of Britain's National Health Service (NHS), famously said that "*a revolutionary moment in the world's history is a time for revolutions, not for patching*." "*Given the combination of the global downturn and the time bomb that is health insurance costs, there is no denying that health care in the United States has reached such a moment. This matter is too important to be left to the politicians and policymakers; there is an urgent requirement for professional clinicians to step up and lead the debate*". (2)

We must begin to discuss it not only with health workers but also with the entire population, creating a large social movement so as not to repeat the same mistakes, as we are already on the brink of the abyss.

While it is a difficult endeavor, we can at least claim the honor of having tried.

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