INTERVIEW: Dr. Salim Yusuf
A Critical Look at Cardiovascular Disease

Interview with **Dr. Salim Yusuf**
MD, PhD, MRCP

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Bachelor of Health Sciences (Honours) Program Class of 2012

Dr. Salim Yusuf, MD DPhil (Oxford), is a Professor of Medicine (Cardiology) and Clinical Epidemiology & Biostatistics at McMaster University. He is the director of the Population Health Research Institute and the Vice-President of Research and Chief Scientific Officer, Hamilton Health Sciences. He was elected fellow of the Royal Society of Canada, and also holds a Research Chair in Cardiology from the Heart and Stroke Foundation of Ontario. His recent research interests include societal, biologic and genetic determinants of population health in developing populations, specifically in the realm of cardiovascular disease. Dr. Yusuf is regarded as a pioneer in cardiovascular disease research and epidemiology in general. By conducting ambitious, multinational studies, he has been able to take fundamental questions and ask them on a global scale. His studies have involved over 83 countries in all inhabited continents of the world.

Q: Dr. Yusuf, could you give our readers a brief background of where your experience with Cardiovascular Disease in developing nations started?

Well, I trained in India and did my medical schooling there. I was then fortunate enough to receive a Rhodes scholarship to go to Oxford to further my studies. Here, I was involved with research to improve outcomes in people with heart attacks—all this work was mainly in western countries like the UK. I eventually found myself in the US working for the NIH [National Institutes for Health] where I learned from colleagues that South Asian populations were highly prone to heart disease. As a person from a developing country I always had this feeling that I wanted to do something for the developing countries and particularly with India.

An opportunity came about in 1990 when a colleague of mine, Dr. Pipes, now a good friend, said he wanted to learn more about the increased prevalence of heart disease in South Asia. We decided to do a simple case-control study on the risk factors for heart attacks in South Asians in India because most of the data on heart disease was from South Asians outside of India at the time. At St. Johns Medical College in Bangalore, we studied 300 people with their first heart attack and compared them to 300 age and gender matched controls. That paper demonstrated that smoking is bad, hypertension is bad, diabetes, abdominal obesity, are all bad—things that you worry about in western populations was the same for South Asians. That paper was published in the Lancet and that study got us thinking.

Q: This study you mention sounds familiar to your work with the INTERHEART study, could you tell us more about that?

Of course—after that single study that I just mentioned, we decided to design a study in multiple centers in India using the same case-control approach and the same protocol as the first study. We were able to get funding.

As we began the study we asked ourselves "why can't we use the same approach for multiple countries?" And this is how the idea of the INTERHEART study was born. With only $25,000, we began exploring options for study locations. Because I was also involved in clinical trials in many different countries I was able to collaborate with those locations; soon the project gained momentum and like a snowball effect more countries joined—it ultimately became a movement rather than just a study. Through the INTERHEART study, we found that nine simple risk factors cause heart disease and they were unanimous globally. This made the thought of global prevention very possible.

Q: Are there other projects that you are still currently involved with?

Yes, following the INTERHEART study, we then set up three different studies. First, we set up the INTERSTROKE study, which is still running. Phase one was published this year. Because of the complexity of stroke, in order to get enough information, we needed thou-

sands of people from many different countries. It will be interesting to see what we find.

A second study we started in Hamilton is called the Family Study. We began with the questions: "when do these risk factors occur? Do they happen at birth, early, or later in life?" In this study, we are following 950 children over ten years and we are beginning to expand the study to rural and urban India as well as Brampton, Ontario specifically South Asian population, to see if there are ethnic variations. We hope to identify a few more countries to help us understand these questions more. Come back and talk to me in 10 years and I will tell you what we have found.

We also asked the question, "why do risk factors develop?" and "are the risk factors at different levels in different parts of the world?" This is what we call "finding the causes of the causes". What has changed in our environment? So we want to ask, "What aspect of the environment has changed and how has this affected us?" So we set up a study called PUrE [Prospective Urban Epidemiology study]. This study includes 17 low, middle, and high income countries. One thing that we are finding in countries, like Canada or Sweden, we only spend 10 to 11 percent of our income on food. If you go to rural areas in poor countries 80% of their income is on food. They often buy the least expensive food, which gives them calories and fats. People from rural areas in developing nations may be growing fruits and vegetables, but resort to selling the food and not eating it. This is an important aspect of their environment. We are trying to relate the environment to the behaviors then we are taking the behaviors and seeing how they interact with genes to see what happens to the risk factors and then look at the risk factors and see what happens with the disease. That is a massive thing, so this study is huge. My hope is to follow these people for 10 more years.

Q: It seems like you had a clinical interest in cardiovascular disease, which shifted to an interest in the social origins of the disease—when did this happen?

You mean like a "road to Damascus" thing. It is hard to say. There was no single shift it was more of a gradual shift. It became a gradual appreciation for the fact that if you really want to improve health, focusing on treating people after they have fallen ill will only get you so far. You have to couple that with preventative medicine. It is a gradual evolution. And it's fun to do difficult things. It is gradual. There is no eureka moment.

Q: You mentioned nine risk factors that are common risk factors for heart disease globally. Specifically, we were wondering what is the role of urbanization in this process?

I think what urbanization has done is it has decreased the amount of energy we expend in day to day activities by shifting occupations from more manually oriented to more intellectually oriented occupation and sedentary occupation. It has changed people's habits for expending energy, especially in developing countries. The second thing is, urbanization is associated with access to foods that are less common, particularly processed foods that are less common. This is typical in developing countries. Now in developed countries, the rural areas have access to all the nasties and those people in the rural areas have access to cars and now that farming is all automated, they are exposed to the same risk factors. Rural health and CVD [cardiovascular disease] in developed countries is going to be worse in rural areas than urban areas. Now in developing countries it is the reverse. The other idea that has come to me is by bringing people closer to each other you are at risk of a contagion, like contagious habits (ie adopting smoking). That is an aspect of social networking we have not studied and we are thinking about studying. Another thing to think about is the fact that cities have always been with us, the nature of cities have changed. If you read Gandhi's autobiography when he lived in London, his room was 6-7 miles from the law school. He would walk each day. Now people take buses. Today you could not walk across a city in a day. Suburbanization is more of a problem than urbanization. Cities are built around the car and not waking and cycling.

Q: At the policy level, what do you think the government of India is doing? Do you think they are doing enough?

I don't know what they are doing, so anything I say in that direction would be substantially incomplete. It is hard to know whether or not they are doing enough, so I won't comment on that. But I will comment on the fact that there is now a great deal of awareness on the national level of what we call lifestyle diseases. They are trying to fund programs. I think one step further is the fact that the WHO [World Health Organization]

is recognizing non-communicable diseases is going to be the biggest burden worldwide including developing countries. There is a meeting of the UN [United Nations] generally assembly next year and there is a significant task force of the WHO that is putting the control of non-communicable disease as a priority, and I am involved in writing a report of recommendations. So there is an effort. Once that happens, hopefully more countries will take this seriously, but these things take time, policy changes take time. And once you change policy it takes a long time to implement the changes. So all the effort we are doing now will only have an impact 20 years from now.

Q: Should governments emphasize efforts more in clinical medicine or public health?

I think you need both. I think it is a mistake to try to make a choice between both. When people fall ill there is an imperative to look after them, plus it is a point of care you cannot avoid and we are quite good at. So if you take the reduction of CVD in the US by 50% half is due to better treatments and half is due to better prevention. Prevention and PH is important and more remote. You never see the heart attack you prevent. Obviously if you can reduce smoking and increase activity, there is value in this. There needs to be a balance, I think the imbalance of this is that most of our dollars is spent on healthcare. Part of it needs to be in public health. We don't need doctors for public health; prevention can be done without doctors. Public health requires regular people. You can have a big impact there. Public health requires the public and medical care requires the doctors. The two must meet with each other.

Q: Does decreasing the exposure to infectious diseases increase the risk of chronic disease?

Not quite. When you prevent people from dying at the age of 5 or 10 and they live to the age of fifty they will get the disease of the people at the age of 50. It is not that you are increasing the prevalence of these diseases, it is that there are more people in these age categories. It is not an inevitable consequence that the prevention of communicable diseases causes heart disease to rise.

Q: Thanks for taking the time to talk to us, and good luck with your work.

It was a pleasure.

LEFT: Dr. Salim Yusuf, Professor of Medicine (Cardiology) and Clinical Epidemiology & Biostatistics, McMaster University

RIGHT: The David Braley Cardiac Vascular and Stroke Research Institute is located at the Hamilton General Hospital. The institute is currently home to Dr. Yusuf's world renowned Population Health Research Institute, as well as several laboratory-based research programs.