

**MOVING
MOUNTAINS**

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MOVING MOUNTAINS

**A Socratic Challenge to the Theory
and Practice of Population Medicine**

Michel Accad, MD

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*Moving Mountains: A Socratic Challenge to the Theory
and Practice of Population Medicine*

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To my wife Avelina for her unfailing support in all my quixotic projects. To our children Salim and Lucy, that they may experience a more humane healthcare system.

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“Hippocrates also pointed out that an inability to identify disease by species and genus leads to the failure of the doctor in his therapeutic aims.... That doctors need philosophy in order to employ their art in the right way seems to me to require no demonstration.... We must, then, practice philosophy if we are true followers of Hippocrates.”

—Galen (129 - ca. 200/216 AD) in *The Best Doctor is Also a Philosopher*

Introduction

This book is an investigation into the theory of population medicine. In particular, it examines the theory of health and disease elaborated by Geoffrey Rose, the late British physician who is one of the intellectual founders of the population health movement. Rose's revolutionary ideas have been highly influential in public health circles. Today, the concepts epitomized in his theory have become guiding principles for healthcare systems around the world.¹

¹ The online encyclopedia *Wikipedia* describes Rose as “an eminent epidemiologist whose ideas have been credited with transforming the approach to strategies for improving health.” Although no one can properly take credit for the rise of the population health movement, which emerged in response to deep-seated factors (as will be discussed in the final chapter of this book), Rose is unique for the explicit attention he has given to the theoretical aspects of population medicine.

Inspired by Professor Peter Kreeft's didactic technique,² I have enlisted the help of Greek philosopher Socrates to cross-examine Rose's work. Using his characteristic method, Socrates subjects the ideas put forth in *The Strategy of Preventive Medicine* to a thorough but fair—and sometimes humorous—critique. The final chapter of the book offers my analysis of the broader context for Rose's theory, a context which looks to population medicine as a replacement for traditional individual care.

Throughout this book, direct quotes from Rose's work are presented in bold type. The exact sources for the quotes and for other citations in the text are provided in a bibliography section at the end the book.

WHO WAS GEOFFREY ROSE AND WHAT WERE HIS MAIN IDEAS?

Rose was born in 1926 and died prematurely in 1993 of pancreatic cancer shortly after publishing his only book, *The Strategy of Preventive Medicine*.³ He studied medicine at Oxford in the 1950s and completed his training at St. Mary's Hospital in London under the tutelage of Sir George Pickering, one of the greatest clinical scientists of the time. Pickering's insights on the

² Professor Kreeft, from Boston College, has produced an entertaining series of introductory books on Western philosophy, e.g., *Socrates Meets Kant*, *Socrates Meets Descartes*, etc., published by Ignatius Press.

³ All citations in the text refer to the 2nd edition of Rose's monograph, published in 2008 and titled *Rose's Strategy of Preventive Medicine*.

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nature of hypertension were instrumental in shaping Rose's views about public health.

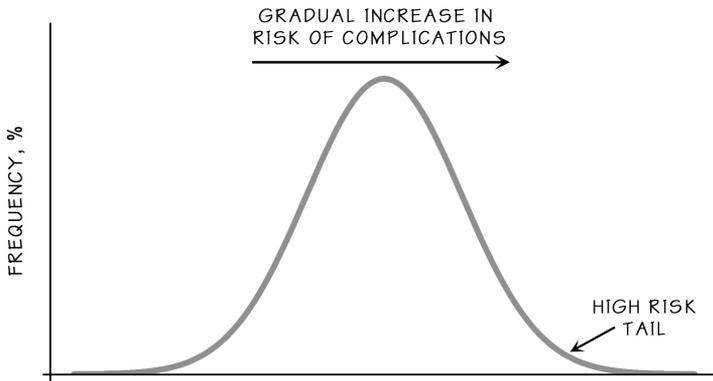
Rose became interested in cardiovascular epidemiology and preventive medicine early in his career. He made numerous methodological contributions to the development of diagnostic standards for coronary heart disease. He was principal investigator, along with the American epidemiologist Jeremiah Stamler, of the INTERSALT study, an important international investigation of the effect of dietary salt on cardiovascular health conducted across 52 different communities worldwide.

In 1985, Rose published his most acclaimed paper, "Sick Individuals and Sick Populations," in which he articulated his population strategy for public health. Initial expressions of his theory, however, had appeared in earlier articles, notably "Strategy for Prevention: Lessons from Cardiovascular Disease," published in 1981.

Three major tenets characterize Rose's theory of preventive medicine. The first tenet is that risk factors for disease in the population are distributed along continuous, bell-shaped curves. Because the risk imparted by risk factors is typically also continuous and graded, Rose believed that for any given disease, most clinical complications occur not in the minority of people at high-risk for the disease (the "tail" of the curve), but in the much larger number of subjects with risk factor

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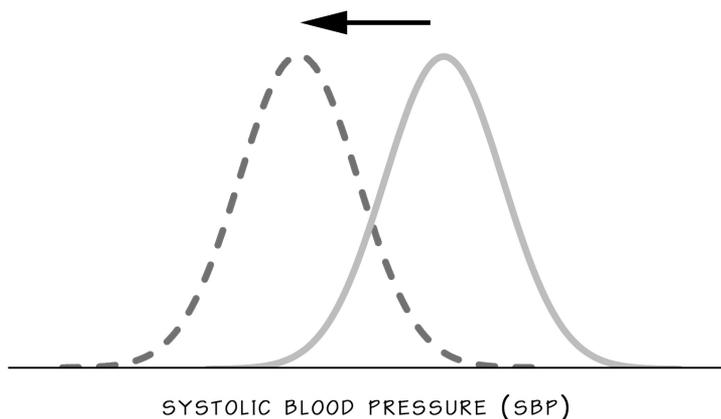
profiles that are within the center of the distribution, closer to the mean.



For example, the vast majority of cardiovascular complications is explained, not by the minority of patients with unequivocally high blood pressure or high cholesterol, but by the bulk of people with more moderate elevations in these risk factors. Accordingly, an effective public health intervention must aim to “shift” the entire bell-shaped curve down the risk scale, rather than “lop-off” the high-risk tail, since the latter approach would have no significant impact on public health statistics. Rose’s approach has been widely adopted in disease prevention circles, as illustrated in the following graph adapted from the 7th Report of the Joint National

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Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure:⁴



PREDICTED REDUCTION IN MORTALITY FROM POPULATION-WIDE DROP IN SBP

REDUCTION IN SBP	STROKE MORTALITY	CORONARY MORTALITY	TOTAL MORTALITY
-2 (mmHg)	-6%	-4%	-3%
-3 (mmHg)	-8%	-5%	-4%
-5 (mmHg)	-14%	-9%	-7%

Beyond cardiovascular disease, Rose was convinced that his preventive strategy could apply to almost any condition: osteoporosis, obesity, hepatitis, neonatal death, depression, lead poisoning, and Down syndrome. According to his theory, all of these conditions display a risk-outcome relationship that lends itself perfectly to a population shifting strategy. Rose affirmed:

These concepts [of risk-outcome relationships] apply to the problems of prevention for almost

⁴ (Chobanian et al. 2003).

every clinical specialty, as well as in occupational and environmental health and in the control of wider social problems.⁵

The second tenet of Rose's theory is that health and disease have a societal dimension, meaning that socio-economic conditions play a determining role in the prevalence of risk factors. Rose and Sir Michael Marmot, then a junior epidemiologist and now a highly influential authority on the question of "social determinants of health," were co-investigators of the famous Whitehall study. That study demonstrated that among British male civil servants, social grade and coronary mortality are inversely related, even after controlling for known coronary risk factors and access to medical care.

The results of the Whitehall study seem to support Rose's contention that health outcomes are influenced by emergent properties of societies and do not simply represent the cumulative effect of individual genetic factors, behaviors, and choices. For example, a man moving from Kyoto to Chicago will be subjected to the risk factor profile of his adoptive population, and his risk will vary accordingly, even without any conscious changes in his lifestyle or behavior.

The third tenet in Rose's theory derives naturally from the second: if social and economic determinants of disease are so important, medical activism must

⁵ (Rose 2008, 110).

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necessarily take on a political form. This is unequivocally stated in the last paragraph of Rose's book:

The primary determinants of disease are mainly economic and social, and therefore its remedies must also be economic and social. Medicine and politics cannot and should not be kept apart.⁶

In that regard, Rose's philosophy is aligned with another dominant movement in public health, one whose primary goal is to eliminate health inequities, defined as "avoidable inequalities in health between groups of people within countries or between countries."⁷ This movement found a home at the World Health Organization; at national public health agencies, such as the Center for Disease Control; within influential advisory organizations, such as the National Academy of Medicine; and in an increasing number of academic departments in the United States and abroad. These bodies have embraced Rose's theory unconditionally.

By prescribing a reduction in health inequities, Rose's theory echoes the thought of contemporary political philosophers, such as John Rawls's theory of social justice. But Rose's ideas provide social justice theories a needed scientific validation. And by broadening the scope of medical care so widely, his strategy allows

⁶ (Rose 2008, 161).

⁷ World Health Organization. Key concepts in the social determinant of health. Available at http://www.who.int/social_determinants/thecommission/finalreport/key_concepts/en/ accessed October 31, 2016.

medicine to become more openly a means of achieving political and economic change. At least, such is its hope.

Judging from his writing, which is simple, elegant, personal, and to the point, Rose was undoubtedly an erudite and a charming man. *The Strategy for Preventive Medicine* is short and easy to read. Its latest edition features a preface by two colleagues—one of whom is Michael Marmot—who describe Rose as a kind and honest person with a brilliant intellect and a contagious curiosity.

I have no doubt that Geoffrey Rose was an admirable man and that his interest for the betterment of mankind was genuine. But I also believe that his strategy, which aims at moving bell-shaped mountains of population characteristics according to the will of public health experts, amounts to a confused hodge-podge of propositions that are untenable on clinical, epidemiological, social, and ethical grounds—or on the basis of common sense alone.

Socrates Questions Rose About His Early Insights

THE SETTING:

A small, windowless conference room. Two bookcases containing out-of-date medical texts and journals line the walls. Small study tables are arranged “conference style” around the room. A large trash can filled with used coffee cups and with Styrofoam boxes emptied of take-out food gives off a rancid smell. The air is still and the ambient temperature stifling.

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*Socrates, wearing a mantle, is seated at one end of the table arrangement. In front of him are his reading glasses, a copy of Rose's **The Strategy of Preventive Medicine**, and two other textbooks. Geoffrey Rose is seated at the corner to Socrates' right, wearing a beige shirt, navy striped tie, and a long white coat. In front of him is a short stack of diagrams and graphs.*

A handful of residents and students in crumpled short white coats occupy some of the remaining seats and manifest a vague interest in the conversation taking place. The room has a small exit door, guarded by an angel.

This is an internal medicine didactic conference held in purgatory.

SOCRATES: I've been asked to explore your theory of prevention, Geoffrey. As you know, I am more comfortable dealing with ethical and philosophical matters, but your work is not strictly concerned with facts of science. I have found it surprisingly stimulating. Are you ready for my cross-examination?

ROSE: I never imagined purgatory would be like this, Socrates. Are you going to demonstrate what St. Paul meant when he said that "fire will test the quality of each person's work?"

SOCRATES: That's the idea. Are you feeling the heat?

ROSE: Believe it or not, I don't mind being on the hot seat. I'm delighted to talk with you about my professional passion. I was forewarned, so I came

prepared with all the charts and material that I need.
Where shall we begin?

SOCRATES: Let's start at the beginning. How did you come to think so distinctly about the problem of "preventive medicine," as you call it?

ROSE: As I mentioned in my book, the starting point for me came from hearing Sir George Pickering explain his momentous insight on the nature of hypertension. It was in the mid-1950s and I was privileged to be his registrar at St Mary's Hospital.

SOCRATES: Pickering was an authority on hypertension, wasn't he?

ROSE: That's almost an understatement! He *was* the authority on hypertension, a man of towering intellect and a dominating personality. He had authored the textbook which, for two decades, was the main reference on high blood pressure. His famous debates with Lord Robert Platt—himself a prominent leader in medicine—were recorded in *The Lancet* where they captured the attention of the medical community for years.⁸ Ultimately, the accumulated epidemiological and clinical research data vindicated Pickering's position.⁹

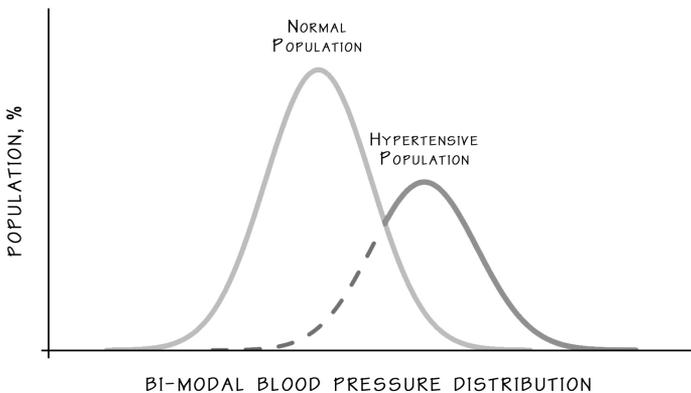
⁸ Baron Robert Platt was a distinguished and influential physician with a particular interest in kidney diseases and hypertension. He became president of the Royal College of Physicians in 1957.

⁹ *The Lancet* correspondence that constitutes the "Platt versus Pickering debates" was captured in a special text edited by Swayles (1985).

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SOCRATES: What was Pickering's insight and how did it influence you?

ROSE: In those days, most of the medical community—Platt included—thought that hypertensive patients formed a distinct population. In other words, most doctors thought that the distribution of blood pressure in the population was “bimodal,” as shown in this figure:



Pickering, on the other hand, believed that the distribution followed a bell-shaped curve with a single peak. He proposed that there is no threshold that distinguishes high blood pressure from normal blood pressure. In fact, in response to those who proposed a distinction between hypertension and “normotension,” he was fond of saying that “the dividing line is nothing

more or less than an artifact.”¹⁰ Given that the risk of cardiovascular events increases as the blood pressure increases, Pickering made the astonishing remark that this was the first instance of a disease that could be thought of as a *quantitative* rather than *qualitative* disorder.

Up until that time, the concept of disease was always understood in dichotomous, or binary terms: you either have tuberculosis or you don't; you either have diabetes or you don't, etc. Hypertension seemed entirely different, offering no clear cut demarcation between normal and abnormal. At the time, I was interested in the conditions that would lead some people to develop coronary disease, and it occurred to me that Pickering's observation could be applied to....

SOCRATES: Before we go any further, I would like to explore Pickering's assertion, if you don't mind. First of all, his idea seems commonplace to me. In my earthly days, we considered every disease as a quantitative imbalance of this or that humor: too much yellow bile makes people irritable, too much phlegm leads to apathy and depression. We inherited the general theory from the Egyptians, but Hippocrates and his followers solidified it. With that in mind, it seems that Pickering's insight was a step backward rather than a forward leap, don't you think?

ROSE: I never thought of it that way!

¹⁰ (Pickering 1968, 178).

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SOCRATES: Second, I don't fully see what must have seemed so novel about Pickering's idea, even in his time. After all, obesity was clearly preoccupying physicians in the 20th century. Is not corpulence a clear example of a quantitative disease?

ROSE: You're right and, in fact, Pickering was fond of saying that blood pressure is a quantity, just like height and weight. But no one really thought of obesity as a disease, really, unless it was obviously morbid. I mean, you wouldn't get people to worry about a few extra pounds, would you?

SOCRATES: You'd be surprised to know that a few short years after your death, the medical community would indeed begin to worry about any amount of extra weight. And I think your theory had a lot to do with that concern, but we'll get to that question in due time. Let's explore Pickering's idea a bit more.

ROSE: Let me then quote from the second edition of his textbook *High Blood Pressure*:

The 'disease' essential hypertension, representing the consequences of raised pressure without evident cause, is thus a type of disease not hitherto recognized in medicine in which the defect is one of degree not of kind, quantitative not qualitative.

The hypothesis just outlined has been greeted by medical scientists 'as a glimpse into the obvious,' and by physicians as 'dangerous nonsense because it is against accepted teaching.' It is apparently

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difficult for doctors to understand because it is a departure from the ordinary process of binary thought to which they are brought up. Is it normal or abnormal, physiological or pathological, health or disease, good or bad? Quantity is not an idea that is as yet allowed to intrude. Medicine in its present state can count up to two but not beyond.¹¹

SOCRATES: That's quite trenchant and seemingly irrefutable.

ROSE: I'd say! You should have seen the bafflement in the audience whenever Pickering shared his revolutionary insight at medical conferences. I, myself, felt that I was witnessing a true Copernican moment in medicine. And I quickly understood the ramifications of this discovery, for if you think about it...

SOCRATES: Before we get to the ramifications, let me probe these ideas a little bit more. I don't want to spend too much time on Pickering, but since his theory forms the backbone of your theory, I must point out that he himself seemed to waffle about "the nature of hypertension."

ROSE: Good Heavens! How could you say that? I was by his side when he began to articulate his argument and, for the next 20 years, he honed it into the sharpest intellectual sword, challenging anyone who would dare to duel with him. Apart from Platt, who was eventually defeated, few stood up to seriously question

¹¹ (Pickering 1968, 4).

Pickering because the emerging epidemiological data inexorably supported his idea: the blood pressure distribution in various populations never revealed any distinct dividing line, cohort studies showed that long-term outcomes were directly related to the baseline level of blood pressure, and clinical trials demonstrated that reduction in the blood pressure at any level of elevation improved long-term outcomes.

SOCRATES: I grant you all that, but if you read his textbook carefully, you will see him equivocating repeatedly.

ROSE: What?!

SOCRATES: Bear with me. For example, in the quote you just gave, he describes hypertension as being "a type of disease not hitherto recognized in medicine." Yet the opening paragraph of the very same chapter from which the quote is drawn makes an even sharper and snappier assertion that "[high blood pressure] is a sign not a disease,"¹² which contradicts the statement that hypertension is a "type of disease."

ROSE: Hypertension is both a sign and a disease. When the cause is known, as in Cushing's disease, it is a sign, but when the blood pressure is persistently elevated for no apparent reason, it is a disease that we call essential hypertension.

¹² (Pickering 1968, 1).

SOCRATES: I am aware of the distinction, but Pickering was still not very clear on that point. First of all, if there were two meanings for the term, he never clarified whether he was talking about the disease or the sign and, in fact, in the first edition of his textbook he even specified that the terms "high blood pressure," "hypertension," "hyperpiesia," and "hypertonia" were equivalent.¹³

Incidentally, William Evans was another prominent authority on hypertension, and he proposed to use one term—hypertonia—to refer to elevated pressure as a sign, and another term—hypertension—to indicate the disease.¹⁴ But so far as I can tell, Pickering never made that distinction clear. In fact, here is another quote: "Essential hypertension represents little, and perhaps nothing more than the upper end of the distribution curve designated as essential hypertension at some arbitrary level such as 150 systolic, 100 diastolic."¹⁵

ROSE: Yes, absolutely, and it is based on this notion that I began to explore...

SOCRATES: Just a minute, my friend, I set the pace of the conversation here!

ROSE: Fair enough.

SOCRATES: When Pickering used the phrase "upper end of the distribution curve" he was talking about the

¹³ (Pickering 1955, 6).

¹⁴ (Evans 1957).

¹⁵ (Pickering 1955, 6).

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blood pressure distribution curve for the population at large, wasn't he?

ROSE: That's right.

SOCRATES: Which implies that there is no specific etiology for the disease operative in any individual patient, but rather, as Pickering would have it, a complex interaction of genetic and environmental factors that operate in the population at large.¹⁶

ROSE: Precisely.

SOCRATES: But, if that's the case, then it's like a disease that affects everybody, including those whose blood pressure is well below any "dividing line."

ROSE: Exactly! That's exactly the point! The entire curve is shifted!

SOCRATES: Except that Pickering was not comparing one curve versus another, and he did not really bring up the problem of an epidemic at all. He simply looked at the curve within a population, typically a Western country, and pointed to the upper end of the distribution as indicating essential hypertension. As far as he was concerned, essential hypertension was "unmasked" when Western populations started to live long enough to manifest its consequences. To him, the British population was essentially a normal population, although he also believed that environmental factors were at play in hypertension. So one obvious question

¹⁶ (Pickering 1968, 290).

is: "In those days, would he have identified a Papuan man with a systolic blood pressure of 135 as hypertensive if that pressure level put him at the upper end of the distribution curve in Papua New Guinea?"

ROSE: You'd have to ask him that question yourself, Socrates!

SOCRATES: Maybe I will, because if he were consistent in his definition of hypertension, he would have had to classify such a person as having essential hypertension, which seems a little crazy to me. Furthermore, when it came to giving an explicit definition of what hypertension really is, Pickering shamelessly gave the "it depends" answer! He advised life insurance companies to ignore any definition based on cut-off points and, instead, told them to construct their actuarial tables on the basis of the baseline blood pressure value measured in a given patient.¹⁷ In that regard, he made perfect sense: the risk of complications gradually increases as the blood pressure value rises.

For the physician dealing with a given patient, however, Pickering clearly side-stepped the answer, offering only some vague advice as to when treatment should be started and when a search for secondary causes would be warranted.¹⁸ On the one hand, a certain cut-off blood pressure level—however arbitrary—must be selected if one is to "define" hypertension.

¹⁷ (Pickering 1990, 14).

¹⁸ *Ibid.*

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On the other hand, Pickering exhorted everyone against using any specific number. In fact, he seemed particularly insistent on avoiding a focus on numbers so as not to frighten the patient needlessly. In the end, I think Pickering was ambivalent about how to deal with this "non-disease disease."

ROSE: I see your point Socrates, and I believe that my theory solves these problems very nicely.

SOCRATES: Very well, Geoffrey. I look forward to exploring your theory in detail, but we have covered enough ground for today. Let's leave that discussion for tomorrow's conference.