CARING FOR AFRICAN HEALTH CARE: READING CLINICAL CASE STUDIES FOR SYSTEMIC INSIGHTS

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Consider a hospital with no oxygen, patients lying two to a bed or on the floor, a nurse-to-patient ratio of 30 to 1, a half-stocked pharmacy, and a lab lacking reagents. How does one doctor in such a setting?

This article uses evidence from African case studies to address obstacles to effective clinical care and possible health systems interventions. Most of the day-to-day provision of medical care in Africa is carried out by overburdened practitioners with too little time and too many patients, often under conditions of systemic failure. Physicians and nurses who are in daily contact with patients work under conditions that are not only difficult: they are so unpredictable that rational medical care and planning become extremely challenging. Drugs, supplies, testing equipment, and laboratory support vary in accessibility day by day and are spread across a difficult referral landscape. Nor, in this rapidly shifting sometimes chaotic environment, can clinical staff develop their own best practices with an expectation that these will remain stable and reasonable over time. These are

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contexts that require a unique combination of evidence-based and empirical reasoning, clinical and institutional creativity, social understanding and ethical sensitivity.[2]

That the practice of medicine is improvised, in a way that departs from idealized flow charts, is of course true anywhere in the world. It has special significance in African settings, however, because of resource poverty and because African medical institutions were undermined by substantial, systemic, and often externally imposed budget cuts in the 1980s and 1990s.[3] The system depends to a significant extent on the efforts of multiple external donors and therefore experiences unusual problems of coordination. Coordination is further undermined by several factors. Patients and practitioners move back and forth, in seemingly random ways, between a new private system of medical care and an older public one. Even within a single institution, research trials may command basic resources otherwise unavailable for normal clinical care. Impoverished institutions outsource many nursing and transportation tasks to patients' families and supporters. All this means that patients move across therapeutic contexts and markets in unpredictable ways.

Between May 10th and May 14th, 2011, a group of 24 clinicians, scientists, and social scientists met at the Wissenschaftskolleg in Berlin to assess current dilemmas of medical practice in Africa. The group grounded its discussions in the intensive analysis of clinical case studies presented by participants. The case studies were hybrid in the sense that they included information about medical diagnoses, treatments, and outcomes, as such, alongside descriptions of the search for medical resources, the coordination of efforts among practitioners, and the behavior of patients and their helpers. Collective analysis of case studies points to the existence of a set of recurring and identifiable problems that deserve further exploration and ultimately remediation. Our discussions revealed specific pathways through which system inadequacies affected clinical practice and patient outcomes.

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2 Wendland, Claire. *A Heart for the Work: Journeys Through an African Medical School.* Chicago: University of Chicago Press, 2010; Livingston, Julie. *Improvising Medicine: Inside an African Oncology Ward.* Duke University Press, forthcoming; Steven Feierman. "When Physicians Meet: Local Medical Knowledge and Global Public Goods." In *Evidence, Ethos and Experiment: The Anthropology and History of Medical Research in Africa*, edited by Paul Wenzel Geissler and Catherine Molyneux. New York, Berghahn Books, 2011.

3 Turshen, Meredeth. *Privatizing Health Services in Africa.* New Brunswick, NJ: Rutgers University Press, 1999.

Such problems animate the background of clinical research in Africa, but are often cleansed out of published research rather than posed as the subject of research itself.[4]

Participants at the meeting all expressed appreciation for the steps taken in recent years to reduce the overall burden of disease in Africa, but with a determination nonetheless that local clinical care really counts – that people suffering from disease or trauma cannot simply be left without effective medical institutions while waiting for health conditions to improve. We noted from two cases of cancer and diabetes that even improved nutrition and a reduction of infectious disease would not negate the need for effective medical care systems. We learned from two maternal deaths of relatively wealthy and well-educated women that while poor people were the most vulnerable in these health systems, the systems themselves were impoverished in ways that universally undermined patient care for everyone.

Together participants reviewed well-known problems in African health systems which are now garnering increased attention: severe staffing shortages, inadequate laboratory facilities, the saturation of private markets (to which patients are regularly directed) with counterfeit or expired drugs and disposables, the absence of specialist consultants, and lack of patient confidence in dysfunctional institutions. It quickly emerged that the holistic study of difficult cases enabled us to trace how the unique ecology of medical care shapes clinical decision-making and effectiveness. We devote the rest of this article to an analysis of key themes emerging from the cases.

Referral and Coordination

Because each case study traces the career of one illness episode through time, it reveals important information about what happens in between treatments, or between primary, secondary, and tertiary levels in the health system, or in the separation between professional and lay decision making. It proved especially revealing of the process of referral. Indeed, it suggested that referral processes are a crucial and troubled domain in African contexts.

We started with the assumption that poverty of resources was a crucial problem, but then discovered that gaps in the referral process, often spurred by the poverty of patients

4 Nguyen, Vinh-Kim. "Government-by-Exception: Enrollment and Experimentality in Mass HIV Treatment Programmes in Africa." *Social Theory and Health* 7, 3 (2009): 196–217.

who could not afford transport to the next appropriate medical center, could actually increase the cost of care for any one patient, sometimes drastically. Often it was family members rather than clinical staff who made referral decisions. An 18-year-old woman, for example, had been the victim of war trauma, including rape and sexual servitude. She had presented at hospitals in her home region with recurrent headaches, unsteady gait, and shaking of the body, along with sad and tearful feelings, and expressing a wish that she were dead. Because of an absence of psychiatric care in her war-torn home area, and because of an emphasis on the treatment of infectious disease, she underwent two years of investigation and treatment, during which she was tested for HIV and syphilis (both negative) and treated for drug-resistant malaria, typhoid, brucellosis, meningitis, and epilepsy. She also underwent lumbar puncture for CSF analysis, throat swabs, thyroid and liver function tests, and blood cultures. All of this effort and expense could have been saved by a correct initial referral/consultation, but such a referral (which would have involved an expensive trip by the patient and her accompanying relative) was accomplished only after years of failed treatment. In another case, a child who was ultimately found to have extended-spectrum beta-lactamase-producing Klebsiella pneumonia was treated for six weeks with expensive antibiotics and tests because the appropriate test and the appropriate antibiotic were not available at the treatment center. In the end the clinician procured a test from a research lab and drugs from a distant city.

Each of the cases revealed that the necessary medical resources were located somewhere in the referral system, but not in regular ways that would enable practitioners to rely on a predictable hierarchy of referral. In one case a patient's family member refused referral from a primary to a tertiary care level because of his realistic judgment that the patient might be harmed by the long wait for treatment of acute disease at the tertiary hospital, which was severely overcrowded. In a case of bronchopneumonia with ARDS, the doctor in charge of a district hospital combined the following resources from diverse locations in the medical system: a telephone consultation with a distant cardiothoracic-surgeon, a fourth-generation cephalosporin (found in, and sent from, the distant capital city), and oxygen canisters from another hospital at a travel distance of three hours. Some essential elements of treatment were completely unavailable: the ability to test for arterial blood gases or to do bronchial lavage or bronchoscopy. The timing of the administration of the drugs that were available was determined not by judgments about the treatment regimen, but by the time taken by the patient's family to find the money to pay for them.

Matching Evidence to Availability

The cases revealed a form of diagonal reasoning by clinicians who sought to align patterns of evidence in conditions which one participant characterized as "diagnostic insufficiency" and treatment possibilities in what we came to call "therapeutic insufficiency."[5] All clinicians work in contexts that entail diagnostic and therapeutic probabilities rather than absolute certainties and which ask them to base decisions on the empirical observation of each individual patient. But, in African contexts where the horizontal structure of primary care is so weakened that basic therapeutic and diagnostic options are unavailable, but well-funded vertical interventions and research projects punctuate that landscape, this form of reasoning is necessarily tremendously amplified – to the extent that we have called it "diagonal reasoning." Its use in African contexts is crucial. However, it can at times blur the line between research, trial and error, and care, and it can also work harm on both the individual level (iatrogenic morbidity) and the level of public health (e.g. drug resistance). Paradoxically, it can also result in the waste of precious resources through the overuse and inappropriate use of whatever diagnostic and therapeutic resources are available.

In several of the cases, a great degree of empirical or trial-and-error therapy was performed on patients. Often this empiricism was necessitated by the diagnostic landscape. For example, the psychiatric patient mentioned above was treated for over two years with antibiotics, antimalarials, analgesics, and anticonvulsants to no avail. Indeed, as some have argued about such cases, in the absence of reliable diagnostics the use of antibiotics is, in fact, the use of placebos.[6] Her case pointed to the difficulties presented by the lack of specialty services and consultations – there was no mental health worker at the local hospital to make her diagnosis. In the Klebsiella case, the patient, an eight-year-old girl, received three fresh whole blood transfusions and two exchange transfusions by doctors who because of insufficient laboratory capacity were unable to locate the source of her

5 Okeke, Iruka. *Divining Without Seeds: The Case for Strengthening Laboratory Medicine in Africa*. Ithaca: Cornell University Press, 2011.

6 Kleinman, Arthur, Harry A. Guess, and Joan S. Wilentz, "An Overview." In *The Science of the Placebo: Toward an Interdisciplinary Research Agenda*, edited by Harry A. Guess and Arthur Kleinman, et al., 18. London: BMJ Books, 2002.

persistent, high fever. Without adequate laboratory support to obtain a precise diagnosis, clinicians were forced to use increasingly desperate forms of empirical intervention.

Limited therapeutic options also lead to a reliance on trial-and-error therapy. Empirical therapy is chosen because it is what patients, accompanying kin, or the hospital or clinic can afford. When physicians don't have what they know are the best therapies, they must decide what is possibly or plausibly the next-best treatment. Yet, published research often does not comment on or systematically evaluate the second- or third- or even fourth-best therapeutic option in the absence of the standard therapy. Thus clinicians were left to reason their way towards the next-best option. In these contexts, local standards of care and idiosyncratic decisions emerged, both of which might benefit from systemic clinical research.

Therapeutic supply was shaped understandably both by cost concerns and by epidemiological assumptions in contexts where there is an overwhelming emphasis on particular patterns of infection, yet this too, while rational, also posed problems. Participants remarked for example on the regular dispensing of antimalarials for patients whose laboratory tests do not confirm infection, because these are the drugs in stock.

Because many African hospitals and clinics lack necessary supplies, patients are often required to purchase basic therapeutic goods like drugs, gloves, or sutures to be used in their care. Not only were necessary treatments greatly delayed by the need for relatives to raise funds to purchase supplies, but relying on laypeople to bring drugs from outside the hospital or clinic also made it more difficult to draw correct conclusions from trial-and-error treatment. Participants noted the diagnostic confusion that occurred after patients had brought back counterfeit drugs. With these, as with poorly maintained diagnostic equipment, clinicians cannot always tell if the patient did not improve because the suspected diagnosis was incorrect, or because the therapeutics were inherently ineffi-cacious.

Time

One of the most revealing discoveries of the case studies was the crucial role of the passage of time. The problems of sequencing, duration, and timing of treatments and interruptions related to the ways trial-and-error therapies are substituted for a robust diagnostic ability and to the difficulties of referral. In the case of Klebsiella pneumonia, five weeks passed from the patient's initial presentation at the hospital until the effective antibiotic

was administered. This raises the possibility that the time passed in the disjointed system of referral – time used to assemble disparate medical resources – might be responsible for the emergence of still more serious disease problems. Five weeks of treatment with inappropriate antibiotics might itself cause antibiotic resistance. Extended and interrupted treatment times also worked to clog already overcrowded health institutions that are perpetually in need of beds.

Treatment trajectories are also greatly elongated because increased privatization has hollowed out public health systems. At many junctures, the diagnostic or therapeutic plan is temporarily suspended while relatives go to raise money to purchase the necessary goods or services. For example, in one case a pregnant woman presented at her local clinic with very high blood pressure, headaches, and dizziness. The midwife at the clinic cautioned that she likely had pre-eclampsia and urged her to proceed immediately to the nearest hospital. Before the patient could attend the hospital, however, her husband had to sell a chicken and a bag of rice to a neighbor in order to raise funds for the trip. At the hospital, the doctor advised her that her situation was serious and that she would require an immediate Caesarean section. The husband responded that they would have to wait a day while he returned home to borrow money for the operation. In this case, fortunately, another accompanying relative had enough money with her to make a down payment so that the doctor could perform the surgery immediately, and both mother and baby narrowly survived. In other cases we reviewed these delays proved fatal.

Training

The social scientists were impressed by the creativity and care revealed by the case studies. We saw the care provided by a psychiatrist who had no way to treat massive war-related mental trauma and so worked to train a generation of psychiatrists, where there had been only a few. We saw the hospital administrator who had no regular access to a supply of oxygen and so is working to acquire the equipment to produce oxygen within her hospital. We saw the physician who, several decades ago, improvised the treatment of AIDS care, borrowing resources here and there, and also helping found a national organization to support families and provide care. We saw the practitioner who insisted on finding the resources to treat antibiotic resistant disease somewhere, anywhere, within a huge national system. This creativity is indispensable. But how are we to formalize and value knowledge embedded in the people within health systems? External donors often

unwittingly seem to come in with their own way of doing things and presume this crucial knowledge away.

Current proposals to improve clinical conditions promote bringing American and European medical students and young doctors to work in these settings.[7] But for all that this may provide a quick fix for staffing shortages, these visiting clinicians will also need new kinds of training in local structures, in how informal networks of health care in Africa work (or don't). They too will have to learn new forms of diagonal reasoning – and their limitations – if they are to be effective contributors to the African hospitals and clinics in which they will work.

One important observation is that effective practice by a physician or nurse in this system requires an unusually entrepreneurial approach because the practitioner must assemble resources from diverse sources. It also requires that the practitioner have detailed knowledge of both the relevant medical literature and of a whole range of social practices, extending from the location of drugs or tests somewhere in a large and disorganized medical system to the likely behavior of patients' relatives, who must sell crops or organize family meetings before the patient can be treated. We returned, again and again, to the importance of teaching these skills to medical students and young house staff. Yet in the end, such skills, however energetically wielded, can only salve, not solve the problems of systematic failure and dysfunctional institutions.

Conclusions

Many of these problems will sound familiar to physicians anywhere in the world. Practitioners in the wealthier North often have to use creative strategies to find the one technician who can solve a problem, or the one consultant with special knowledge of a disease, or the correct approach to treating a patient when the appropriate drug is much too expensive. In under-resourced parts of Africa, however, these problems, and the requisite skills, exist in extreme forms. When, for example, in contexts with high rates of maternal mortality patients in urgent need of Caesarean sections are sent away to find rubber gloves and other supplies before the surgery can be performed, then the difficulty and

7 Bradford Kerry, Vanessa, Sara Auld, and Paul Farmer. "An International Service Corps for Health – An Unconventional Prescription for Diplomacy." *The New England Journal of Medicine* 363, 13 (September 23, 2010).

urgency of improvisation are greater. While it is clear that improvisation will remain important to successful clinical practice, the systemic problems revealed by the case studies point to potential interventions.

Physicians who must treat patients without the full range of diagnostic technologies have a desperate need for local epidemiological knowledge. For example, they need accurate information about local pathogens and patterns of antibiotic sensitivity, so as to prescribe more effectively.

Programs to sustain and improve health worker professionalism are urgently needed. Professionalism, in these contexts, includes the mastery of what we have called diagonal reasoning. Such training must be supported by research directed to the urgent clinical needs of practitioners on the ground, in circumstances in which a full diagnostic work-up is not possible, but in which choices among empirical treatments must nevertheless be made.

At a time when large numbers of health workers are likely to come from outside the continent, it is important to recognize that these helpers have not been trained in locally-specific methods of improvisation or diagonal reasoning or in working correctly without the normal diagnostic tools. These newly introduced health workers must be trained in the relevant skills.

Multiple donors, giving intermittent or poorly coordinated donations, distribute medical resources, which are then scattered in unpredictable ways through the larger medical system. Practitioners need greater predictability in the location of drugs and diagnostic technology. Donors could achieve this through greater coordination and better tracking of resources.

We need careful economic research to learn whether investments in improved diagnostics would lower overall costs, given the tendency to overtreatment in the absence of adequate diagnosis and given pressures towards antibiotic resistance.

We are encouraged by the renewed attention to strengthening health systems in global public health.[8] The grounded insights of the sort that emerge from detailed analysis and

8 Frenk, Julio. "The Global Health System: Strengthening National Health Systems as the Next Step for Global Progress." *PLOS Med* 7, 1 (January 12, 2010); Pfeiffer, James et al. "Strengthening Health Systems in Poor Countries: A Code of Conduct for Nongovernmental Organizations." *American Journal of Public Health* 98, 12 (December 2008): 2134–2140; Reich, Michael R. et al. "Global Action on Health

discussion of cases can and should play a critical role in identifying areas of necessity and strength within health systems. Together we call for increased attention to African medical systems, which are deeply in need of care.

Systems: a Proposal for the Toyako G8 Summit." *The Lancet* 371, 9615 (March 8, 2008): 865–869; Ellner, Andrew, Gene Bukhman, and Paul Farmer. "Pathways to Health Systems Strengthening for the Bottom Billion." *Routledge Handbook of Global Public Health*, edited by Richard Parker and Marni Sommer, 117–130. London: Routledge, 2011.