

## EDITORIAL

### TECHNOLOGY FOCUS, CLINICAL SKILL, AND ECOLOGICAL CONTEXT IN TROPICAL DISEASE

Changing technology perspectives have played a major role in defining the heightened expectations for disease management on the global scale over many decades: witness advances in diagnostic and therapeutic capability. This viewpoint has driven biomedical industry expansion, research funding and career hopes in the context of anticipated outcomes of applied science. In terms of technical achievement the expectations can, in some respects, be judged to be on target, as new tools, new drugs, new industrial strategies enter the market place in fairly regular sequence.

In terms of science this process has generated a variety of strategic methodologies that allow modifications of existing technical databases to be rapidly adapted to new challenges, so in principle to reduce bench-to-market lead times. This is evident, for example, with respect to fields such as immunology where the compendium of available diagnostic options is already of considerable magnitude, some available for remote field application, others requiring well equipped laboratories in fairly central locations. It is evident in fields such as neurosurgery where pre-operative localization of specific lesions using major machinery has revolutionized the art but remains a central hospital undertaking.

Technical innovation is a sort-after commodity, permeating much of society, transiently motivating many to entrust their savings to the Nasdaq board, dreaming of instant riches but so often tasting unsavory crashes in fortune. Biotechnology and information technology companies bewilder us all with their visions of splendor alongside potential for disappointment, pied pipers in modern garb playing the pipes of Pan that once in mythology led children to utopia land and now lead us to eternal hope of riches on the one hand and conquest of poverty and disease on the other.

In the past medical schools focused heavily on the acquisition and practice of clinical diagnosis and management at the bedside, the then challenge to the teacher being the transfer of clinical skills sufficient to deliver each new generation of

physicians to the community with ability to visualize the pattern demarcated by symptoms and signs formulated into definable problem sets well enough to permit reasonable patient management within existing therapeutic paradigms. Careful history taking and hands-on physical examination in skilful hands were not trivial weapons and the skills could be transferred to primary health care workers to significant extent.

Then the technology revolution began to run faster and faster, delivering wave upon wave of instrumentation and assays that were time saving and more accurate in the diagnostic game, leading to greater success in disease and injury management, so that reliance on clinical prowess gradually diminished as it was forced to take a backseat. Laboratory and imaging analysts grew in stature, acquired rising medico-legal authority and in many cases became the primary strategic chessmen in the business. Neurosurgery without an MRI scan, for example, became largely obsolete and so became dependent on location in big medical centers in major cities; it also became more expensive.

Cost-effectiveness analysis entered into prime focus as the technology bandwagon rolled on and expectations soared. The giants of the pharmaceutical industry ushered in an ever-increasing range of therapeutic drugs and associated, advertising-enhanced profits. The public-private health care debate rose sharply in the political market place, complicating and confounding even the best laid plans for cost-containment and equity in care delivery.

This scenario was enacted mainly in wealthy nations and in the wealthier urban enclaves of poorer nations. Much of the tropical world was and is largely located outside these privileged arenas. Its ecological environs are the rainforests, rivers and rice fields of the pan-equatorial world, a fiscally poorer world but also a world rich in culture, capability and community structure. The same instrumentation companies and pharmaceutical companies expected to fulfill the roles of suppliers in this milieu as the needs became better defined accord-

ing to the simple paradigm:

tropical zone needs = temperate zone needs + specific tropical zone needs

So corporate marketing managers envisioned a simple strategy: increase the market size for items in the first category by introducing loss-leader items aimed at the second category. Rapid diagnostics for tropical diseases began to flourish, with claims of their utility in the village where they would enhance the role of the primary health care workers by taking over the dependence on their clinical diagnostic skills. However, long-term viability this strategy will always be uncertain, as companies focus on the short term bottom line and pull back from what they see as unprofitable enterprise, leaving health systems with technology-based strategies that cannot be fulfilled reliably in the longer term. Diagnostic kits of this type are thus liable to withdrawal from the market at any time and even while availability is satisfactory are considered to be too expensive by many health ministries, so that reliance on clinical diagnostic skills is thrown into the uncertainties of on-off demands.

One factor in the diagnostic equation is the desire of influential agencies such as WHO to encourage the acquisition of the technology in order to standardize the management of disease in global ecological context, so as to facilitate improved individual outcomes and improved global communicable disease control. Thus we witness the dictate that malaria diagnosis, for example, should always be made on the basis of microscopy or dipstick assay, whereas in trained hands and in ecological context clinical diagnosis should be able to give reasonable approximations. If that capability is not supported then disease management suffers when the coffers needed to acquire and apply the technological solution run dry. The rational, respected committees sitting in judgment are comprised to significant degree by those who do not have to run on empty, while industrial wisdom is dispensed behind closed doors.

In a sense, then, we might modify the concept of ecological context not only in terms of the geographic, climatic milieu but also in terms of economic, political and corporate sphere of influence. Such variation on the norm goes well beyond routine cost-benefit analysis. This means that sustainable strategies will always include unknowns and

perhaps unknowables, necessitating flexibility that is contrary to the academically promoted standards. The conclusion is not that ideals should be abandoned but that provision is needed for this flexibility in the strategic planning and training processes.

In reality the ecological context of the village cannot easily be divorced from the globalization process yet the dictates of the urban power base are dominant. Disease patterns belie the traditional textbook ecological confines as populations move to and fro between rural and urban settings, so that the demands for diagnostic accuracy and therapeutic efficacy cut across these barriers of the past. The extent to which traditional approaches can be retained alongside increased technical inputs is one element of practical consequence in handling the current and future complexity of disease containment.

In this general context it is interesting to note the growing recognition of the importance of health and disease in the economic perspectives expressed in many tomes on globalization that have proliferated in recent times (*eg* Hutton and Giddens, 2000; Hertz, 2001; Stiglitz, 2002). To some extent this change reflects the impact of the HIV-AIDS pandemic in some halls of national and global power, but it goes wider than this, to the recognition that disease is a high barrier to global prosperity that has widespread roots and implications for overall economic strategy. This recognition, to be useful, demands high level representation in the political structure of nation states and in the corporate boardrooms that have a disproportionate influence on the socio-economic dimension. This recognition must at the same time encompass the reality that successful solutions will come locally, driven by trained local personnel utilizing appropriate technology.

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## REFERENCES

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