

Exploring Creative Linkages Of Healthcare Industry And Academia In United Arab Emirates (1970 – 2018)

Main Naser Alolayyan Mohammad Chand Jamali

Abstract: Several medical councils and health authorities are now progressively focusing on Indigenous developments through International standard linkages and Collaborative research projects employed by Industry and academia to realize quality in patient care; new medical procedure for management and advance surgeries. The paper adopted the empirical methodology and developed the Literature Review to gather evidence of the prevailing Industry and academia research linkages in order to achieve quality in medical related patient care. This paper explores supportive linkages and med collaboration for sharing new experiences among International and regional hospitals and universities of UAE and International med research hubs with a view to affect improvements.

Executive Summary : The part one of the paper scans relevant healthcare literature in the subjective field. The second section articulates the practices of the researcher undertaking the survey and the perceptions of the quality administrator of the hospital supervising the collaborative research. The viewpoints provide a richer understanding of required collaboration for wider objectivity. This research was able ascertain advance the future needs of the health care system basing on available data sets of doctors' satisfaction and quality intents of the hospitals; nevertheless understanding the substantial challenges to piloting a research project in an industry setting. The hospitals and academia were able to advantage from collaborative research's venturing review of literature, available data sets of patients', records maintained by the Government, libraries, hospitals; and reflections of the contemporary literature, analysis and suggestions based on practical endorsements.

1 INTRODUCTION

Athe growing healthcare-management has tremendously changed in the past few decades led to various vertically integrated collaborative projects, issues leading to effective productivity of healthcare units. In this regard, teams of managers, administrators and clinicians have combined together to bring about effective designs that may also boost innovative strategies of healthcare. Thus, they oversee the plan to implement such frameworks coupled with the backdrop of creativity and innovation. Consequently these professionals are taking responsibility to support such environment in healthcare setups the productivity is also improving in terms of quality of teamwork, treatment, solutions and many other issues being faced by HealthCare industry. Here the trends of healthcare industry are inevitable to study that may be linked with academia and other industrial practices to augment and synchronize the ties between the two sectors. UAE Government is investing and spending huge amount (R255.1 Billion 55% Of GDP) on various Public heads including the HealthCare sector.

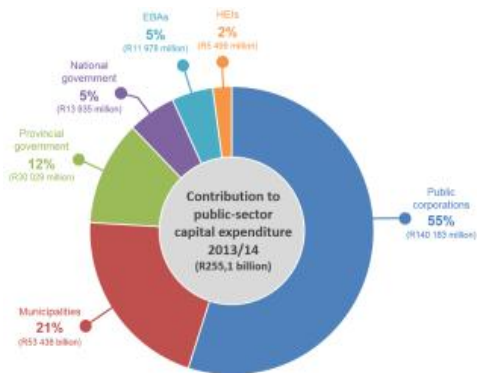


Fig 1: UAE contributed R255.1 billion to public Sector during 2015

There is a need to develop a thorough understanding which may support the implementation to bridge the gap between health care practice and development of academia research portfolios through other management frameworks. A study reported that today patients receive one-half of the preventive care recommended by the medical practitioners followed by care for chronic conditions and acute conditions, while other received care which was not recommended and rather harmful for the patients. There are so many other issues related to access to care and healthcare screening results which are particularly encountered by ethnic minorities in UAE. Here academia might provide consultancy and solutions based on sound management case studies and theoretical models. Notwithstanding the fact that these are considered as concerns in healthcare industry, patients are somewhat content with the quality of treatment and the general treatment which they receive. The literature has also reported that healthcare quality comprises safety issues related to treatment facilities and technological facilities. As such, it goes to the credit of management of healthcare units that they have not been able to sufficiently optimize the resources available at

- Jordan University of Science and Technology, Faculty of Medicine, Health Management and Policy Department. mnalolayyan@just.edu.jo
- Khawarizmi International College, Program Leader, - HMS, Department of Health & Medical Sc, 87977, Al Ain, Abu Dhabi, United Arab Emirates. mjamali68@gmail.com

their disposal to improve the healthcare overall infrastructure. Therefore, there is need to design comprehensive authoritative plan and implement healthcare design frameworks which are challenging and fulfill the need of inexpensive handy contemporary healthcare practices. More of the problem is related to implementation of such design frameworks which require due involvement of professionals. Whereas professionals critically view the concerns in terms of poor incentives and professional barriers they face during their careers. The paper intends to address the gaps which arise mostly in the form of communication and information between the professionals that primarily create problems for effective design of frameworks. There is a need to acquire a solid theoretical framework using which may provide positive outcomes to both healthcare professionals in the industry. Healthcare Policy Institutes need to bridge the gap between the academia through reported evidence and healthcare practices. In United States, the Services Administration's Bureau of Primary Health Care, which provides funding facilities to different sponsoring units in the country also provide policy guidelines and closes the gap by bringing practitioners of healthcare and management closer. The objective of such Institutes is to address the real issues faced by healthcare industry and reduce their problems giving quality to both healthcare and management. Moreover, healthcare units and their management expect to develop strong work teams which may develop records and at the same time engage employees in activities that optimize the infrastructure of healthcare management based on information systems, patients' complaints management system, and other feedback. Thus the crucial role of academia, Industry, and management might enhance implementation framework for healthcare infrastructure and further describe ways that promote harmony between the academia and the healthcare units in the industry through management. It is further posited that there are some key factors such as technology and productivity of healthcare units in terms of employees' involvement, and other initiatives that help the two sectors create synergy for future sustenance.

U.A.E. NATIONAL HEALTHCARE STRUCTURES 1971 – 2018

Seven distinguished states of the UAE: Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaimah, Sharjah, and Umm-al-Qaiwain signed a treaty in July 17, 1971, 'Crucial Sheikdoms', forming the unity of the Sheiks and an agreement to settle difference of opinions among Sheiks and finally conjuring to the materialization of the United Arab Emirates. UAE is member of, United Nations, World Trade Organization and Organization of the Islamic Conference, Arab League, and the Cooperation Council for the Arab States of the Gulf fulfills its obligations and responsibilities. Nevertheless, exceptional infrastructures have also justly made the country an International tourist attraction. United Arab Emirates is situated in the Southeast of Arabian Peninsula in Southwest Asia on the Persian Gulf. Oman and Saudi Arabia are the bordering kingdoms of the UAE. The serene Indian Ocean surrounds and adds the sky blue ocean color to the fascinating land of UAE. Abu Dhabi is the capital and is the second largest city in the country. Business accomplishments, skyscrapers, and state of the art building, sports complexes and hotels also set pace and add charm to the tourism, modern culture and enlightened eminence. Cultural diversity and groups in the country include of the Emiratis, non-Emirati Arabs, Pakistani,

Iranian, Indian, Chinese, and Thai. Arabic is the lingua franca and English is also widely spoken and used for documentation in the country. The political structure of the country is Federal Constitution Monarchy. UAE has been gifted with abundant natural reserves which include Sea trade routes, fisheries and oil. The UAE invested these natural resources wisely for building of the vital infrastructures for tourism, shopping complexes, education, sports arenas and developing international standard medical facilities in collaboration with USA and Europe. Standards of education and health care are considered to be generally high in the United Arab Emirates, resulting from increased government spending during resilient economic years of 1980. UAE government statistics reflect that, total disbursement on health care from 1996 to 2003 were AED 1,601,384,360.05 [US\$436 million]. World Health Organization, statistics show that: in 2004 total spending on health care instituted 2.9 percent of gross domestic product (GDP), and US\$497 was estimated per capita. Healthcare currently is free only for UAE citizens. The World Bank categorized Dubai and Abu Dhabi as being the 2nd and 3rd, respectively, popular medical and tourism destinations in the region.

ORIGINS OF HEALTH CARE IN THE UAE

The health care in the United Arab Emirates started during 1943, with Basic healthcare unit was established in Dubai. In 1951, under the patronage of Sheikh Saeed bin Rashid Al Maktoum, the Al Maktoum, hospital was built in phases comprised of 157-bed hospital. During 1960, American missionary Mr. Pat and Marian Kennedy established a clinic in Al Ain, officially known as the Oasis Hospital, for local people. During 1966, a small outpatient department opened in Abu Dhabi, followed Dr. Philip Horniblow to cultivate a national health service. This initiative was followed by ruler of Abu Dhabi, Sheikh Zayed, to organize a Central Hospital, in 1968, which encouraged the Private sector in the U.A.E led by Iranian Hospital, Dubai, the Gulf Medical University and the GMC Hospitals as the founder in the private medical education and healthcare sectors.

UAE HEALTHCARE MARKET TO GROW 12.7% TO DH71.56BN BY 2020

It is reported that projected forecast of UAE healthcare market to grow 12.7 to 71,56bn by 2020 (Alpen Capital). Outpatient and inpatient markets are projected to reach Dh44.4bn and Dh27.5bn, respectively, by 2020, achieving an annual average growth of 12.7 per cent, marginally higher than the GCC growth average. The outpatient and inpatient markets are projected to reach \$12.1 billion (Dh44.4 billion) and \$7.5 billion (Dh27.5 billion), respectively, in 2020. The UAE Economists forecast is likely to experience an increase in demand for the number of hospital beds at nearly 3 per cent every year to reach more than 13,800 beds by 2020, according to Alpen Capital's GCC Healthcare Industry report. With its vision to develop world class healthcare infrastructure, expertise, and services, the UAE government is extensively expanding and upgrading its healthcare systems to match international standards. U.A.E. accounts for 26 per cent of the total healthcare expenditures by GCC governments and the per capita healthcare spending in the UAE was at \$1,569 in 2013, the second highest in the GCC. According to Alpen Capital, the GCC healthcare market is projected to grow at a 12.1 per cent CAGR from an estimated \$40.3 billion in 2015 to \$71.3 billion

in 2020, driven by an increase in the population and rising cost of treatment. From an estimated \$24 billion in 2015, the outpatient market is forecasted to reach \$42.4 billion in 2020. The inpatient market is anticipated to grow from \$16.4 billion to \$28.9 billion during the same period. Healthcare Organization the UAE now operates 40 public Hospitals, compared with only 7 in 1970. The Ministry of Health is undertaking a multimillion-dollar program to expand health facilities and hospitals, medical centers, and a trauma center in the seven emirates. A state-of-the-art general hospital has opened in Abu Dhabi with a projected bed capacity of 143, a trauma unit, and the first home health care program in the UAE. To attract wealthy UAE nationals and expatriates who prefer treatments abroad for serious medical care. Dubai is developing Dubai Healthcare City, a hospital free zone offers international-standard advanced private healthcare and provides an academic medical training center; since 2010. The mega med structures attract over 12 million visitors to Dubai every year for healthcare facilities. Emirate of Abu Dhabi since January 2006, residents of Abu Dhabi are covered by a new wide-ranging health insurance package; expenses will be shared amid employers and employees. Prior to 2007, government owned health care facilities were managed by the General Authority for Health Services, GAHS. In 2007, this authority was restructured into:

- Health Authority Abu Dhabi is in-charge for regulating the healthcare industry and developing health policy.
- Abu Dhabi health Services Establishment, SEHA is accountable for supervision of government-owned healthcare services in Abu Dhabi. Presently, SEHA manages 57 Primary Health Care Centers, 13 Hospitals, 3 Maternal and Child Health Centers, 3 Specialized Dental Centers, one center for Autism, and 5 Specialized Facilities like rehab, blood bank and herbal center.
- Emirate of Dubai - Dubai Health Authority (DHA): for public and private healthcare facilities in the Emirate of Dubai - Dubai Healthcare City (DHCC): for private healthcare facilities with Dubai Healthcare City. UAE Ministry of Health (MOH): for public and private healthcare facilities in the Emirates of Sharjah, Ajman and the rest of the north Emirates, also few public facilities in Dubai like Al Baraha Hospital and Al Amal Psychiatric Hospital. A survey initiated in 2012 by DHA with the intention of surveying all healthcare facilities in Dubai in order to set up Dubai Clinical Services Capacity Plan 2020 (DCSCP). The UAE is actively expanding its national healthcare system to meet the growing needs of the populace and vertically integrate economic diversification, with prominent U.S. medical centers, organizations, and academic institutions sharing vital progression. All seven emirates offer healthcare facilities to their community and growing healthcare arrangement of comprehensive hospitals and clinics, while concurrently evolving local healthcare expertise and workforce. The U.S. and U.A.E. healthcare units are sharing major HealthCare expertise; include Children's National Medical Center, Cleveland Clinic Abu Dhabi, GE Healthcare, and Johns Hopkins health care facilities. The partners extend the persistent concerns of U.A.E. healthcare field of I.T. infrastructure integration, diabetes and non-communicable disease prevention, workforce development, pharmaceutical pricing and licensing, and insurance issues. The progressive pace of U.A.E. and U.S. healthcare expertise exchange have streamlined UAE healthcare system and created many new jobs, boosting economies of both the partners. U.A.E. healthcare segment is corridor of opportunities for U.S as

healthcare relationship dates back to 1960s when American missionaries Dr. Pat and Marian Kennedy set up a makeshift hospital in a mud-block guesthouse donated by Sheikh Zayed in Al Ain, an oasis in the Emirate of Abu Dhabi. The Oasis hospital grew rapidly and by 1964 developed major infrastructure and served the Gulf region and laid the foundation for the U.A.E.'s healthcare sector Initiative.

U.A.E. HEALTHCARE SECTOR

Since gaining independence in 1971, the U.A.E. developed world class healthcare services to address the health problems of Emiratis. Conditions commonly caused by sedentary lifestyles and fast food consumption, such as obesity and diabetes, are on the rise, as are diseases found among the aging population of Emirati nationals, such as heart disease and cancer. Meanwhile, the U.A.E.'s healthcare system has been striving to keep up with immigration-driven population growth and struggling to control rises in per-capita healthcare spending caused by increasing levels of affluence and chronic disease. The U.A.E. healthcare sector is divided between public and private healthcare providers. Public healthcare services are managed and regulated by federal and emirate-level government entities such as the Ministry of Health, Dubai Health Authority, the Health Authority Abu Dhabi, and the Abu Dhabi Health Services Company (SEHA). These entities often partner with foreign healthcare organizations to run the daily operations of hospitals and clinics throughout the U.A.E. Private healthcare service providers such as the New Medical Centre are non-government run hospitals and clinics that provide specialty and full-spectrum care for the U.A.E. population. Needless to say, these Emirati private sector initiatives, like New Medical Centre and Al Noor Hospital, are very important to the U.A.E.'s overall and long-term healthcare development. As the nation strives to realize its healthcare goals under the direction of the Ministry of Health, it is important to note that the evolution of healthcare services is a top priority in all seven emirates. Dubai's 2015 plan correspondingly centers on transnational U.S. healthcare providers to — improve health system planning to ensure service availability, accessibility, and quality. What sets the U.A.E. apart from other countries in the Gulf is that the federal and individual-emirate governments are backing this vision with significant and strategic investments intended to drive the industry forward. In 2013 alone, U.A.E. healthcare expenditures reached an estimated \$16.8bn. However, the U.A.E.'s relatively small population has hindered the government's development of specialty care practices, and gaps still exist across the nation in critical areas such as women's care, oncology, pediatrics, and diabetes care. Patients traditionally have obtained this care outside of the U.A.E. in places such as India, Thailand, and Singapore, but are increasingly focusing on North America as well. This transfer of capital is significant as the International Medical Travel Journal estimates that Emiratis travelling abroad for treatment spend roughly \$250,000 per visit. Nevertheless the U.A.E. is rapidly improving its healthcare sector in the hope of providing quality care in-country, as opposed to having patients travel around the world for a higher level of care. This focus is creating opportunities for U.S. healthcare organizations. Expertise in medical supplies, equipment, and management services are in great demand. This includes cardiovascular medical devices, firms that can design and build hospitals, and healthcare organizations that have

experience administering and staffing general hospitals and specialty clinics.

	2014	2015	2016*
Population (million)	9.3*	9.6*	9.9
GDP (US\$ billion)	402.0	370.3*	375.0
GDP Per Capita (US\$)	43,213*	38,650*	38,050
Real GDP Growth (%)	4.6	3.9*	2.4
Inflation (%)	2.3	4.1*	3.6
Exports (US\$ billion)	367.4	333.2	314.4
Exports (% change)	-1.0%	-9.3%	-5.7%
Imports (US\$ billion)	240.6	241.2	238.8
Imports (% change)	+4.3%	+0.2%	-1.0%
Exchange Rate (UAE Dirham: US\$)	3.67	3.67	3.67

Source: IMF, EIU, Central Bank of the UAE, UAE National Bureau of Statistics
* estimates

2 RESEARCH OBJECTIVE

To measure the role technology and higher level of research linkages play between industry and academia in raising greater workplace productivity.

3 RESEARCH QUESTION

Does research linkages of Industry and Academia are related to hospitals quality and greater productivity?

4 LITERATURE REVIEW

A literature review encompasses of the combination of the significant literature to the research occurrence with the tenacity of fostering academic and professional growth and change (Wolfswinkel, Furtmueller, & Wilderom, 2013). The purpose of this empirical U.A.E. based study was to explore what healthcare Industry and academia linkages can strategies in existing healthCare structures. Further to identify practices, expertise and gaps to plugin and employ futuristic foreign collaboration. The understanding from this study may benefit the Emirates, foreigners and Industry business owners, CEOs, managers, and the Emirates and workforce of developing economies employed in U.A.E. Variation in healthcare infrastructures and lack of local expertise acted as the hallmark of combined research cultures at work in healthcare universities and industry, viewed with concern replacement of old vintage technology with sophisticated technology at economic platform, as it replicates the diverse cultures and academic viewpoints (Fusch, Fusch, Booker, & Fusch, 2016; Schumpeter, 1942; Van Teeffelen, 2017). The U.A.E Government is well aware of the environments and constructs environments friendly practices and manifesto within the mega projects. Environment-friendly practices are gaining cognizance against old vintage technology and toxic chemical processes (Schumpeter, 1942; Smallbone, Walter, Voytovich, & Egorov 2010). Global economies are currently undergoing daunting challenges and anticipating harnessing growing unemployment and ecological concerns (Wolfswinkel, Furtmueller, & Wilderom, 2013). Collaboration can be described as the pooling of knowledge, capacity, resources, and interests. Through sharing tasks, a product is produced that can promote professional development of all members involved (Beattie et al. 1996; Pittman et al. 1991). The process of collaborative research has been described as the —The six C's of collaborationll (Lancaster, 1985) and includes the

contribution, communication, commitment, compatibility, consensus and credit being identified by both parties. Successful collaboration between hospitals and academia is instituted upon these processes. In addition the disclosure of self-interest should be openly discussed, and in this way trust is established and the collaboration can develop to meet the needs of each party (Anderson et al. 2011). The positive outcomes of collaboration between academia and hospital settings have been described as significant (Boswell and Cannon, 2005; Campbell and Taylor, 2000; McCoughen and O'Brein, 2006). These outcomes include the integration of education, practice and research (Downie et al. 2005). Moreover, collaboration provides a means to bridge the practice-theory gap whereby best practice outcomes are realised (Downie et al. 2005; Gererish and Clayton, 2004; Wallin et al. 2003). The advantages of collaborative research include the development of trust between parties through mutual benefit to promote research and quality health effects (Downie et al. 2005; Taylor et al. 2007). The development of trust across the divide is a fundamental issue as hospitals and academia work together to achieve the joint objectives of the research. The study can include a mistrust of academia staff by hospital staff (Gaskill et al. 2003). Gaskill et al. (2003) describe the difficulties of developing trust between staff employed by hospital, and the research staff employed by the universities. Hospital staff may be suspicious of academics and may not cooperate in the desired or anticipated way. Staff may also consider that their own personal practice is being examined and this may result in a barrier between staff and researcher. In addition staff may perceive the research as a management strategy, which could have alternative motives such as changing staff/client ratios, ward closures and service provision (Gaskill et al. 2003). In addition McCloughlan and O'Brein (2006), describe that politics and power, inadequate resources, poor commitment and ineffective communication within organizations may become problematic for both parties. There is an acknowledged tension therefore between those who advocate for closer links (Downie et al. 2005; Gererish and Clayton, 2004; Wallin et al. 2003) and those who acknowledge the very real difficulties that might undermine constructive collaboration (Gaskill et al. 2003; McCoughen and O'Brein, 2006). The space between these positions offers opportunities to build capacity and achieve mutually beneficial outcomes. This is founded on existing relationships between the partners.

THE RELATIONSHIP, CONTEXT AND PREPARATION

The key process here was the need to negotiate with people with different perspectives and understandings of what was manageable and realistic given the inevitable constraints in such project. The obligatory project of significant quality and magnitude for student community, while the hospital needed information that could be helpful in understanding how the organization are tracking and that could be poised while observing routine work . This process is vital for collaborative projects (McCloughlan and O'Brein, 2006). In order to shape awareness and trust within the staff who would participate in the survey, the student engaged in several activities, both prior to the survey being distributed and also during the period that the survey was being conducted. Table 1 describes the strategies that were undertaken to engage participants in the survey. As previous surveys had been undertaken on a regular basis (every two years) staff was anticipating this survey. The

awareness of the staff was seen by the student as a positive factor, however it became apparent that not all staff were willing to contribute to the research.

HEALTH-INDUSTRY & ACADEMIA LINKAGES STREAMLINING POLICIES

If comparison of U.A.E is drawn with African countries; international health experts have questioned Africa-based manufacturers' proficiencies to source competitively estimated, quality medicines on a timely basis (Kaplan and Laing 2005; Seiter 2005; Kaplan et al.2011; Wilson et al. 2012), fearing therefore a negative impact on medicines access. Industrialization experts in the meantime have concentrated on advancement of lower technology export sectors and primary product processing in Africa. Public health research linkages meanwhile have mainly disregarded industrialization as a public determinant of health (CSDH 2008; Battams and Matlin 2013), while research on health systems strengthening has lumped industry into a general category of other relevant input sectors (Bigdeli et al. 2014). The health system benefits of local production of pharmaceuticals in SSA are contested, while access to medicines remains generally poor. A current wave of pharmaceutical industry investment offers an opportunity to link industrialization to improved access to medicines. A local health' policy perspective can identify policies for health–industry linkages that benefit both health systems and industrial development. However policy makers, industrialists and researchers in Africa are increasingly exploring and promoting synergies between local industrial production of pharmaceuticals and medical supplies and improvement in coverage and quality of health care, especially for low-income populations (Government of Uganda 2002; Republic of Ghana 2004; African Union 2007, 2012; Berger et al.2010.

Key Messages: Organization (WHO) strategic framework for medicines and health products (WHO 2017a: 8, 12) recognizes the relevance of local manufacturing of quality medicines and health products for access, a view reflecting collaborative UN research and policy (UNCTAD 2011; WHO 2011a; Sidibé et al. 2014). Linkages between health policy and industrial change in low and middle income country (LMIC) contexts more broadly are increasingly researched (Srinivas 2012; Shadlen and Massard da Fonseca 2013). Meanwhile, low-income populations in SSA continue to suffer severely inadequate and exclusionary health care undermined by poor access to medicines and supplies (Wagner et al. 2011; WHO 2011b; Bigdeli et al. 2014; Wirtz et al. 2017). This article draws on recent fieldwork to address the implications for global health of the shift in African perspectives on health–industry linkages, a shift embedded in a wider policy narrative on building resilient, inclusive and sustainable economic systems (African Union 2014a) We first outline a 'local health' framework emerging from interviews and data collection, mainly in Tanzania and Kenya. We then trace how this perspective embeds health system strengthening within local industrial–health system linkages and wider economic, technological and industrial development. Finally, we discuss the implications for global health perspectives. A concept of 'local health', as it emerges in our interviews and current African policy debate, is rooted in a dialogue between proximity and positionality. 'Proximity' refers to cumulative local interactions and mutual influences arising from co-

location (Boschma 2005). 'Positionality' (Rowson et al. 2012) refers to the influence of location of agency on the framing of issues and priorities, with attendant claims to power and legitimacy in policy making Proximity can usefully be analyzed on three dimensions: geographical proximity, relational proximity and the values assigned to proximity (Eriksen 2013). In health research, geographical proximity is measured as a determinant or index of accessibility of services; in industrial development, as an explanatory factor of industrial clustering of related industries. In health – industry linkages, geographical proximity potentially generates more rapid supply response. Relational proximity echoes the health literatures recognition of local culture as an important determinant and contributor to health services' response to population needs (Hahn and Inhorn 2009); in industry, it reflects what has been called industrial 'atmosphere', the cumulative benefits of local learning and spillovers of tacit knowledge (Ravix 2014) and relationships with universities and government. In health–industry linkages, it reflects the scope for a more agile response to local needs within local economies. Finally, the values given to proximity can be picked up in mutual understanding, legitimation and trust in known health care providers; in collaboration between input and final product producers; and in merited trust in locally produced health care products. Positionality, defined by local power, agency and responsibility, is reflected in locally distinctive priorities and in sharply differentiated views—as compared to global health approaches—on risk, security and timescales for policy making. For example, local interviews on health supplies emergency planning priorities focused on day-to-day immediate emergency needs, while for pandemic preparedness, a central concern was local scientific competence and production capacity, recognizing a positionality-derived imperative on governments to protect their own populations first. These distinctive local concerns pull closer together policies for industry, science and health around strengthening security of pharmaceutical supplies for local health care. They interconnect risk management with local health security, safety and responsibility. As Giddens (1999: 7–9) argues, in contexts of uncertainty and innovation, risk and responsibility are closely interrelated. For local policy makers to assume greater responsibility for medium term risk management requires the building of greater technical and organizational capability in health- and industry-related skills. Increasingly this imperative is framed in terms of ownership: To be able to generate wealth and give its future generations a chance, Africa must take ownership of its health (Lopes 2014). Positionality thus invokes claims of legitimacy for policy and practice we trace in our findings the implications of this local health perspective in local health policy, and the emerging interconnections with industrial change. We document the locally perceived relevance of local production for health, and explore the scope for incentive alignment across sectors. The Findings subsections thus identify what potential health benefits from industrial proximity are locally recognized; note current policy scope for exploiting those synergies; and identify areas where incentivizing industrial development in pharmaceuticals and supplies can also incentivize responsiveness to health sector needs, and conversely where reshaping procurement can open markets for local firms, in an incentive-compatible spiral of improvement. Aligning incentives for local health and industrial improvement the key concerns about medicines expressed by health policy makers

were quality, price and availability/reliable supply. The interviews identify areas where policies incentivizing industrial development can also incentivize responsiveness to health sector needs, and vice versa, extracting proximity benefits in the form of synergy between sectors. East Africa-based manufacturers face sharp price competition in their domestic private markets and in bidding for tenders, since imports benefit from the EAC's zero common external tariff for essential health supplies, while some imported inputs face duties and taxes. Africa-based manufacturers also suffer inherent cost disadvantages, notably inadequate and costly national infrastructure such as power, water and transport, forcing complementary investments, e.g. in back-up generation, and also market size constraints. Economies of scale are not large in basic formulations (tablets and capsules), but Africa-based manufacturers must import active pharmaceutical ingredients (APIs) in smaller quantities, generally at higher prices than competing Indian and Chinese firms. Local manufacturers can frequently meet competition by accepting lower margins than those earned on imports (Chaudhuri and West 2014). However, import price competition appears to have intensified, notably in basic antibiotics: Tanzanian interviewees in 2014 reported amoxicillin imports priced below API import cost. Local supplies of low margin basic essentials had dropped sharply in Tanzania, including amoxicillin, as local firms' business strategies refocused on higher margin products. The region, however, lacks key regulatory infrastructure such as high-quality reference laboratories, and needs a stronger scientific and technical base to support regulatory and training institutions. Regulatory effectiveness is uneven, with Tanzania generally recognized as having the strongest regulator, while Kenyan health sector and manufacturing interviewees were looking for regulatory improvement. Strengthening regulation incentivizes joint venture development and technology transfer: an interviewee from a multinational firm in 2017 stated that they were 'aware of some of the key weaknesses of local pharma [in Kenya], for example around quality assurance and quality inspection procedures, and would not want to put our reputation at risk'. Regional regulatory harmonization is advocated by manufacturers to simplify intra-regional exports, and NEPAD's Africa Medicines Regulatory Harmonization (AMRH) provides a platform, as would the mooted Africa Medicines Agency. Local regulators can exercise closer oversight of local as compared to Indian firms, but regulatory capture remains a danger. Supporting effective independent regulators is a key role for external actors. Skills and training was seen by many as the area most in need of investment. Health systems need more effective supply chain and procurement management, but lack the necessary trained staff (Wiedenmayer et al. 2015). In 2013, 53% of Kenyan and 73% of Tanzanian health facility interviewees responsible for ordering had no relevant training. They also lack competent laboratory technicians. Nationally, medicines policy and health management need clinical pharmacists and pharmacological scientists. These requirements overlap with the needs of industry. Pharmaceutical technicians represent one large cross-sector gap. Industrial laboratories struggle to recruit and retain skilled staff. All manufacturers cited industrial pharmacy and chemical engineering skills needs as well as biochemistry, microbiology, biomedical engineering and other allied sciences. Across the region, some tertiary institutions are introducing industry attachments, but much more is needed as

the technical and scientific base for industrial growth (MIT and UNIDO 2012). Industrial development creates incentives for mutually beneficial pharmaceutical training. Medicines policy and regulation, several stakeholders argued, must bridge the health–industry divide. A professional association official argued for the need to 'cook our own food through professionalism and good regulation. Regulation of a knowledge industry such as pharmaceuticals is underpinned by science, technology and innovation; medicines policy is underpinned by clinical skills; and the two must work together locally. Skills inadequacies not only impede these ends, but, as one Kenyan respondent noted, they 'also leave the few and over-stretched professionals available vulnerable to manipulation through corrupt practices'. The Science Technology and Innovation Strategy for Africa (STISA 2024) (African Union 2014b) speaks to this need to build regulatory and laboratory quality assurance skills through initiatives such as U.S. Pharmacopeial Convention (USP) Ghana's Centre for Pharmaceutical Advancement and Training (CePAT). In Southern Africa, regulation and skills training are being collaboratively developed through the ZAZIBONA (Zambia, Zimbabwe, Botswana and Namibia) initiative, matching experienced with inexperienced regulators in joint inspections across the four countries, to feed into NEPAD's AMRH programme.

ROLE OF UNIVERSITY – INDUSTRY – GOVERNMENT LINKAGES IN THE INNOVATION PROCESSES OF A SMALL CATCHING-UP ECONOMY

5 DISCUSSION:

'Local Health' and 'Global Health': Questions Of Framing

The Health-Care system strengthening in local industrial development challenges of thought in global health. Rooted in earlier international health work that extended public health concerns across geographical boundaries (Battams and Matlin 2013), the global health literature and campaigning has generated initiatives by 'global'—i.e., high income country-based—actors to address vast international disparities in mortality, morbidity and human wellbeing (Koplan et al. 2009; Rowson et al. 2012). These initiatives, by The Global Fund, the US President's Emergency Plan for AIDS Relief (PEPFAR) and others, have saved huge numbers of lives and also, importantly, have reframed understanding and obligation within high-income countries. Nevertheless, the global health field is framed and dominated by commentators, researchers, funders and campaigners based in high income countries, with associated positions of power and privilege (Horton 2014; Shiffman et al. 2016; Sheikh et al. 2017). The positionality of the global health field is reflected in its theme of globalization, of porous borders and global threats (Macfarlane et al. 2008). It converges with a growing literature on health security addressing cross-border fast-moving infectious diseases, HIV and biological weapons/bioterrorism, focusing public and policy attention on protecting high income populations from diseases emanating from low- and middle-income countries (Aldis 2008). Global health actors, furthermore, have operated on the underlying assumption that medical health technologies are readily available commodities; that utilization and access can be generated in a timely manner from global pharmaceutical value chains; and that 'global' advances in

knowledge benefit all For 'local health' actors, none of these assumptions look secure: the risk calculation is different. Diversification of supply to include competent Africa-based firms promises to reduce risk in the medium term, as do increasingly responsive local supply chains. A Kenyan interviewee argued in 2017 that emergency preparedness is a whole system challenge, including responsive suppliers and the industrial and scientific capabilities to address future challenges. Proximity and health–industrial linkages then move from irrelevance to centrality in local policy concerns. U.A.E Positionality outside high income contexts thus generates distinctive health needs and priorities, time-scales and perceptions of opportunities and risks (and risk management) in crafting robust health systems in country through building local and international collaborative capabilities. The WHO's 'building blocks for health system strengthening include access to essential medicines (WHO 2010); they do not include the industrial capabilities to supply those commodities.

6 CONCLUSION

While the UAE 'local health perspective is distinct from global health viewpoints, it is not necessarily in contradiction. A local health framework, focused on exploiting the interrelated health and industrial benefits from proximity, throws into relief the relevance of positionality. It challenges global health actors to recognize and manage their own (large) industrial impact, and to do so in recognition of the legitimate agency of UAE policy makers in seeking medium term strengthening of their local health–industrial linkages and associated scientific and industrial capabilities in the interests of sustainably stronger local health systems and a stronger industrial base. From UAE perspectives, the huge rise in medicines procurement from abroad, arising from global health initiatives, has opened opportunities to link industrial development into strengthening their own health systems in the medium term. This article has sought to outline a 'local health perspective, based in UAE evidence, on some of the key opportunities to align industrial and health objectives to the cumulative benefit of both sectors.

7 REFERENCES

- [1] Beattie, J., Cheek, J., Gibson, T. 1996. The politics of collaboration as viewed through the lens of a collaborative nursing research project. *Journal of Advanced Nursing*. 24, 682-687.
- [2] Pittman, L., Warmuth, C., Gardner, G., King, J. 1991. Developing a model for collaborative research. *Australian Journal of Advanced Research*. 8(2), 34-40.
- [3] Lancaster, J. 1985. The perils and joys of collaborative research. *Nursing Outlook*. 33(5), 231-238.
- [4] Anderson, T.L., Dixon, K.H., Lewallen, L.P., Jarrett-Pulliam, C. 2011. Nursing research: Get started. *Nursing Management*, 42(3), 20-23.
- [5] Boswell, C., Cannon, S. 2005. New horizons for collaborative partnerships. *Nursing World*. Online *Journal of Issues in Nursing*. 10(1), 7.
- [6] McCloughlan, A., O'Brein, L. 2006. Interagency collaborative research projects: Illustrating potential problems, and finding solutions in the nursing literature. *International Journal of Mental Health Nursing*. 15, 171-180.
- [7] Taylor, B., Kermode, S., Roberts, K. 2007. *Research in Nursing and health care: Evidence for Practice* (3rd edn). Thomson: South Melbourne. 36 Showcasing Creative Linkages of HealthCare Industry & Academia
- [8] Downie, J., Ogilvie, S., Wichmann, H. 2005. A collaborative model of community health nursing practice. *Contemporary Nurse*. 20(2), 180-192.
- [9] Gererish, K., Clayton, J. 2004. Promoting evidenced-based practice: an organisational approach. *Journal of Nursing Management*. 12, 114-123.
- [10] Wallin, L., Bostrom, A.M., Wikblad, K., Ewald, U. 2003. Sustainability in changing clinical practice promotes evidenced-based nursing care. *Journal of Advanced Nursing*. 41(5), 509-518.
- [11] Gaskill, D., Morrison, P., Sanders, F., Forster, E., Edwards, H., Fleming, R., McClure, S. 2003. University and Industry partnerships: Lessons learnt from collaborative research. *International Journal of Nursing Practice*. 9, 347-355.
- [12] Kaplan, W. and Laing, R. (2005). —Local Production of Pharmaceuticals: Industrial Policy and Access to Medicines II. World Bank HNP Discussion Paper
- [13] Seiter, A. 2005. Pharmaceuticals, counterfeits, substandard drugs and drugs diversions. HNP brief No. 2, 2005, 1:4.
- [14] CSDH (2008). Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva, World Health Organization.
- [15] Battams, S & Matlin, S. 2013. 'Research, Development and Innovation for Global Health,' chapter in Kickbusch, I, Emmerling, T, (eds) *The European Union as a global health actor*, World Scientific
- [16] Bigdeli, M., Peters, D. H., Wagner, A. K., & World Health Organization. (2014). *Medicines in health systems: advancing access, affordability and appropriate use*.
- [17] Sidibé, M., Yong, L., Chan, M., 2014. Commodities for better health in Africa: time to invest locally. *Bull. World Health Organ*. 92 (d).
- [18] Srinivas, S., 2012. *Market Menagerie. Health and Development in Late Industrial States*. Stanford University Press, California.
- [19] Shadlen, K., Massard da Fonseca, E., 2013. Health policy as industrial policy: Brazil in comparative perspective. *Polit. Soc.* 41/4, 561 – 587.
- [20] Wirtz, V. 2017. Essential medicines for universal health coverage. *Lancet*. [http://dx.doi.org/10.1016/S0140-6736\(16\)31599-9](http://dx.doi.org/10.1016/S0140-6736(16)31599-9)
- [21] Boschma, R. A. (2005) Proximity and innovation. A critical assessment, *Regional Studies*
- [22] 39 , 61 – 74. 37 Showcasing Creative Linkages of HealthCare Industry & Academia
- [23] Eriksen, SN (2013) Defining local food: constructing a new taxonomy – three domains of proximity. *Acta Agriculturae Scandinavica Section B: Soil and Plant Science* 63(1): 47–55.
- [24] Rowson M, Smith A, Hughes R, Johnson O, Maini A, Martin S, Martineau F, Miranda JJ, Pollit V, Wake R, Willott C, Yudkin JS. 2012. The evolution of teaching

- global health in undergraduate medical curricula. *Global Health*. 8: 35-10.1186/1744-8603-8-35.
- [25] Ravix, J.L. 2014 . Localization, innovation and entrepreneurship: an appraisal of the analytical impact of Marshall's notion of industrial atmosphere. *Journal of Innovation, Economics and Management* 14: 63 – 81.
- [26] Hahn, R. A., & Inhorn, M. C. (2009). *Anthropology and public health: Bridging differences in culture and society* . Oxford: Oxford University Press
- [27] Giddins, A. 1999. Risk and responsibility. *Modern Law Review*. Vol. 62, Issue.1.
- [28] Ozawa, S., & Pongpirul, K. (2013). 10 best resources on ... mixed methods research in health systems. *Health Policy and Planning* , czt019. <http://doi.org/10.1093/heapol/czt019>
- [29] Horton, R. 2014. Offline: The third revolution in global health. *The Lancet*. Vol. 383. No. 9929
- [30] Aldis, W. 2008. Health security as a public health concept: a critical analysis. *Vo. 23, Issue. 6*