

Integrating Research into Policy and Programmes Examples from the Jamaican Experience

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ABSTRACT

Research into selected health problems across the life cycle are discussed with respect to the application and impact of the findings on policy, programme development and health outcomes. Special emphasis is placed on health research that focussed on the perinatal period, the young child and adolescent, the epidemics of chronic diseases and violence and the linkage between health and tourism. The lessons learnt over more than two decades of practice in the field of public health from conducting research aimed at developing an indigenous evidence base for policies and programmes in Jamaica are summarized.

Integrando la Investigación con las Políticas y los Programas Ejemplos de Experiencias en Jamaica

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RESUMEN

El presente trabajo discute la investigación de determinados problemas de salud a lo largo del ciclo de la vida, con respecto a la aplicación e impacto de los hallazgos sobre políticas, desarrollo de programas, y resultados de salud. Se pone énfasis especial en las investigaciones de salud enfocadas al período perinatal, el niño y el adolescente, la epidemia de enfermedades crónicas y la violencia, y el vínculo entre la salud y el turismo. Se resumen las lecciones aprendidas en más de dos décadas de práctica en el campo de la salud pública, llevando a cabo investigaciones encaminadas a desarrollar una medicina autóctona basada en la evidencia para las políticas y los programas en Jamaica.

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INTRODUCTION

Despite the high quality of research conducted at The University of the West Indies (UWI) during the decades of the 1960s and 1970s, the medical undergraduate and postgraduate curricula did not stimulate students to become interested in or involved in research. At the end of the 1970s, the realization developed that public health and health service research was absolutely necessary for the development of effective health policies and programmes. Faced with limited resources, competing priorities and a multitude of competing technical opinions and interests,

there was urgent need for the evidence from relevant research to guide the decision-making process.

This paper provides an overview of examples of research conducted during the past 25 years that has impacted on selected health problems across the lifecycle.

Pregnancy and the Perinatal Period

At the beginning of the 1980s, maternal mortality ratios were reported to be fewer than 50 per 100 000 live births, despite anecdotal evidence to the contrary. Walker *et al* (1) undertook a comprehensive confidential review of all maternal deaths for the period 1981 to 1983 which indicated that the maternal death ratio was really 105 per 100 000 live births. The leading causes of death were hypertension, haemorrhage and infection and main high risk groups were primigravidas and women para five and over. This led to the full implementation of the policy for all high risk women to deliver in hospital.

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A 1981 Ministry of Health (MOH) report (2) and a study by Desai *et al* (1983) indicated that under-registration of infant deaths in Jamaica ranged from 33 to 54% with even greater under registration of stillbirths (3). Perinatal mortality studies between 1965 and 1975 indicated that the rate remained unchanged at 38.8/1000 (4). No other data existed, yet many felt that to improve the situation more neonatal special care facilities were needed.

Between 1986 and 1987, a study was implemented to determine the perinatal and neonatal mortality rate for Jamaica, identify causes of death and determine the maternal, social and environmental factors predictive of fetal and early infant deaths (5). This national community based study had 3 components:

- a) The main cohort study interviewed 10 401 women who gave birth to 10 509 infants (including 98 pairs of twins) between September 1 and October 31, 1986 [Phase 1] (6).
- b) The mortality component reviewed all stillbirths and neonatal deaths among babies weighing over 500g born between September 1 1986 and August 31, 1987 (7) and included autopsies of 51% of the perinatal deaths (8). Maternal deaths were also reviewed over this period (9).
- c) The morbidity component evaluated all neonates admitted to special care nurseries between September 1, 1986 and February 28, 1987 (10).

Policy issues arising from analysis of these data covered areas of health service delivery (organization of the service, maternal education, maternal mortality surveillance, auditing and quality of care) and health management systems (manpower development and deployment, information systems, physical facilities, particularly design and equipment). Results also lead to the identification of areas requiring further study and the testing of interventions to correct deficiencies identified.

Some of the findings and policy issues that were addressed are:

- 1) Only 9% of neonatal deaths and 12% of stillbirths were registered (11). The data provided the justification for the World Bank Social Sector project which included support for correction of the serious deficiencies in the national registration system of births and deaths and financing for the modernization of the Registrar General's Department.
- 2) Sixty-five per cent of births at the Victoria Jubilee Hospital in Kingston, Jamaica, were unattended because the physical layout of the labour ward, designed to provide privacy, made proper supervision of the patient impossible. Maternity wards at two regional hospitals had occupancy rates of over 150%. These findings led to (a) the re-design of the layout of the labour and delivery wards at Victoria Jubilee Hospital and (b) the design and construction of new wards at three regional hospitals to enable

better supervision during labour, reduce the number of unattended deliveries and facilitate a more baby friendly environment.

- 3) Midwives had limited skills in neonatal resuscitation. A review of training programmes was conducted and additional in-service training implemented for all staff, with emphasis on management of labour and care of the newborn (12).
- 4) Studies of sexually transmitted infections in pregnancy showed that women who most frequently needed to be screened for syphilis were the ones who failed to attend the laboratory for testing, resulting in the birth of infants with congenital syphilis (13). This led to the introduction of RPR testing to screen mothers for syphilis in the antenatal clinic, providing on the spot results and initiation of treatment for seropositive women. The programme has been expanded nationally, replacing the RPR test with the Trust antigen test. Today, congenital syphilis is a rare occurrence [Communicable Disease Report, MOH 2005] (14).
- 5) The study on maternal deaths found that women who did not have easy access to expert maternal care were twice as likely to die from pregnancy-related complications as those who lived near to facilities with these professionals. This risk was six-fold greater with respect to hypertension-related deaths (9). This led to implementation of a pilot intervention to test the effectiveness of a high risk antenatal clinic and referral system on the occurrence and outcome of pre-eclampsia and eclampsia. The field test resulted in a 35% decline in the occurrence of eclampsia, including a 65% decline in antepartum eclampsia and a significant reduction in the number of in-patient days required for the treatment of hypertension in pregnancy (15). A parallel study tested the impact of educating mothers on the danger signs of pregnancy complications and found that this empowered women to seek care more promptly (16). This system of high risk clinics and referral has now been implemented nationally.
- 6) A multi-country field test of a criterion based clinical audit system was done in two Type B hospitals in Jamaica (17, 18) in collaboration with the Dugald Baird Centre for Research on Women's Health, University of Aberdeen, Scotland. Including hospital teams in the review and problem-solving process led to improved record keeping and quality of care. The methodology has been adapted for auditing care in other areas, for example, hypertension and diabetes management.
- 7) Based on the evidence from these studies, a comprehensive reproductive health programme was developed and implemented nationally. This included the reopening of the schools of midwifery, deploy-

ment of additional obstetricians, standardization of record keeping, treatment protocols, the expansion of maternal mortality surveillance and improved systems of quality of care.

Infants and the Young Children

During the 1970s, malnutrition was one of the leading causes of death in children under five years of age. Much valuable research was carried out by renowned researchers at the Tropical Metabolism Research Unit at UWI which enabled significant improvements in the management of malnutrition. However gastroenteritis (GE), the leading cause of death in these children, along with infectious illnesses such as measles, whooping cough and other diseases preventable by immunization, increased the severity of malnutrition and overall childhood morbidity and mortality. Dental caries was a leading cause of child morbidity, with the potential for long term impact into adulthood.

Gastroenteritis

In 1978, oral rehydration therapy (ORT) was introduced on an *ad hoc* basis but doctors were not convinced that it could correct the dehydration and electrolyte imbalances associated with GE. Some also felt that the sodium concentration of 90 mmol/litre that was in the World Health Organization formulation was too high and would result in hypernatraemia.

Three studies were conducted to provide answers to these issues:

- a) In-patient study to determine the effect of low and high concentrations of sodium and potassium in oral rehydration solutions (ORS) in the treatment of children hospitalized with diarrhoea.
- b) Outpatient study to determine the safety and effectiveness of oral rehydration therapy (ORT) in the treatment of children with GE.
- c) Maternal education intervention to determine the acceptance of ORT and caregivers ability to utilize the ORS packets correctly.

The in-patient study found that 98% of children were satisfactorily rehydrated without the use of intravenous (IV) fluids, with no occurrence of hypernatraemia. The outpatient study showed that 88% of children with GE could be rehydrated using ORS alone. Only 4% *versus* 55% in the pre-study period required IV fluids; and 6% *versus* 16% in the pre-study period required admission. An evaluation of the maternal education programme found that 85% of mothers accepted the method (19).

This led to implementation of ORT nationally. GE surveillance systems were established, staff training and public education programmes were implemented. An evaluation of the quality of care provided to in-patients and of the effectiveness of service delivery identified weaknesses in case management which lead to the retraining of staff and incorporation of ORT therapy into the curriculum of medical students (20).

Improved management of GE has contributed to decreasing the severity of malnutrition, fewer admissions for GE and reduced duration of hospital stay, resulting in cost savings. Although outbreaks of GE still occur and there is continued need for surveillance, it is no longer one of the five leading causes of death in children in Jamaica.

Immunization

In 1982, Jamaica experienced an epidemic of Type 1 poliomyelitis resulting in 60 cases of paralytic illness, three of whom died (21). At the time of the epidemic, immunization coverage was under 20%. Analysis of the costs of the epidemic in 1982 indicated that US \$2.2 million was required to control the epidemic, whilst at that time an immunization programme to prevent poliomyelitis would have cost one tenth of the amount spent on controlling the outbreak (22).

Confirmation of the cost effectiveness of immunization led the Government to make immunization a priority. This facilitated mobilization of funding from international donors and the local private sector and the enactment of legislation making immunization of children compulsory. By 1985, national serological surveys showed that 80% of children had received three or more doses of oral polio vaccine and 81.4%, 94.7% and 72.3% were seropositive to polio virus Types 1, 2 and 3 respectively (23). Coverage for other vaccine preventable diseases such as whooping cough, diphtheria and measles now remain consistently high (>85%). Jamaica was declared polio free in 1994.

Oral Health

A 1987 Decayed/Missing/Filled Teeth (DMFT) survey found that fewer than 3 in 100 children were free of caries and the DMFT rate in 12-year old children of 6.7 was considered high by WHO standards. A 1985 Columbian study showed the effectiveness of salt fluoridation and a PAHO dentist recommended its use in Jamaica. A 1995 survey found an 84% reduction in dental caries in 12 year-olds, with a DMFT rate of 1.1. No side effects such as dental fluorosis were observed (24).

Child and Adolescent Development and Behaviour

Worldwide, as in Jamaica and the wider Caribbean, the increasing prevalence of violent, aggressive and antisocial behaviour have been of great concern. A parallel challenge for Jamaica and many other developing countries has been the low levels of educational achievement among school-leavers. Both problems are believed to have their origins in childhood, creating the need to better understand the determinants and factors that promote or retard child development and behaviour.

Child development research in Jamaica from the 1970s to the early 1990s focussed mainly on the effects of poor nutrition on the young child's development and the effects of child rearing practices and stimulation in the home on the child's developmental score in low income homes (25–27).

Associations between poor nutrition, poor health and socio-economic status and poor school achievement were demonstrated in children of low socio-economic status (28, 29). Children fed breakfast showed improvements in nutritional status, school attendance and achievement scores (30). These findings led to the introduction of breakfast programmes in many schools.

Research on child behaviour was initiated more recently with studies on the epidemiology of the behaviour syndromes in general and in clinic-referred populations of children (31–33). These, along with other studies (34–35); provided much information but were limited as the samples were mainly taken from selected inner-city populations (36).

Against this background, follow-up studies of the birth cohort of Jamaican children, born September to October 1986, was undertaken when they were 11–12 years (1977–1999) (37) and 15–16 years of age (2001–2003). The study samples of 1720 (11/12 years) and 1565 (15/16 years) were the children who lived in Kingston and St Andrew (including the rural areas) and the Portmore area of St Catherine and were identified through the school system.

The studies sought to:

- 1) Determine the pattern of behaviour, cognition and educational attainment and the factors influencing them
- 2) Determine the children's experiences of violence and the impact on their development and behaviour.

Questionnaires were completed by parents, teachers and the children as follows:

- a) Parent(s) reported socio-economic, child health, child behaviour, family functioning (FACES11), health utilities index and in the 15-16-year survey, parental stress.
- b) Teachers were asked to complete the child behaviour check list.
- c) Children reported on exposure to violence, self-esteem (Harter's) and completed the child behaviour check list. They were tested using a wide range achievement test, Raven's progressive matrices (deductive reasoning), Peabody picture vocabulary test (verbal comprehension) and anthropometric data were collected.

Several important findings from these major studies that have influenced policy and programme development for children and adolescents include:

- 1) Parental stability and family functioning was associated with better cognitive and academic outcomes and less behavioural disorders. Parental instability and child shifting was associated with attention problems, delinquency and aggression.
- 2) School performance and behaviour were positively influenced by leisure reading, involvement in organized after-school activities and attending church.

- 3) While boys and girls had similar potential as measured by cognitive function, significant gender differences in school achievement and behaviour was documented, with girls out-performing boys.

4) Behaviour/Aggression/ School Performance

- a. Television watching of over 20 hours per week, particularly watching action films, soap operas and talk shows were associated with significant behavioural problems.
- b. There were strong associations between poor academic achievement (literacy and numeracy) and behaviour problems.
- c. Poor and inadequate basic school/early childhood and primary school environments were associated with greater aggression and delinquency.
- d. Children at both extremes of anthropometric measurements manifested greater behavioural problems than their peers (38).

- 5) Severe forms of physical violence (39) had been witnessed by 25% of the children and a fifth had been victims of violence (boys more than girls).

These findings have contributed to the:

- 1) Development of the Broadcasting Commission's children's television programming code.
- 2) Examination of the quality of basic schools and the development of minimum standards for these schools.
- 3) Evaluation of parenting programmes and the development of a national parenting policy and strategy (in progress).
- 4) Policies and programmes of the Early Childhood Commission established to oversee the comprehensive development of programmes and services to children from birth to primary school entry.
- 5) Inclusion of violence prevention in the National Healthy Lifestyle policy and strategic plan. Interventions aim to integrate organized after-school activities, improving literacy and parenting.

The Epidemic of Violence

In 1998, violence related injury mortality in Jamaica was estimated at 45 per 100 000 population. However, in Kingston and St Andrew it was 117 per 100 000. These very high rates created the need to better understand the pattern and magnitude of violence-related injuries and their impact on the health services.

Studies of injuries presenting to the Accident and Emergency Department at three hospitals (Kingston Public, Cornwall Regional and May Pen Hospitals) found that 51% of all injuries were violence-related, occurring primarily among males 25–44 years of age, 57% caused by a sharp object and 49% perpetuated by acquaintances (40). Police data however indicated that homicides were mainly due to use of firearms.

The impact of violence on the hospitals' services was very significant. It is the leading cause of hospital deaths among young males age 15–29 years and the second leading cause of hospitalizations. Cost studies estimated in 1999 that in-patient care for persons with injuries was JA \$839 million (US \$19 million), consuming 18.3% of the recurrent budget for public hospital care (41). Simulation analysis of non-fatal violence-related injuries demonstrated the potential savings that can be realized by reducing violent crimes (42).

Based on these findings, a national injury surveillance system was developed and implemented at the Accident and Emergency Departments of all the Type A and B (referral) hospitals on the island (43). Analysis has been enhanced with the development of a geographic information system which allows for spatial analysis, combining community specific data, with police, health and other related data (44). This has led to the establishment of a Crime Observatory for the Western Kingston Police Division which uses the findings from these analyses to develop intervention strategies through a consultative process involving the community, the police, other agencies and non-governmental organizations (NGOs) working in the area in collaboration with the UWI Centre for the Study of Public Safety and Justice.

The Chronic Disease Epidemic

Like most of the English-speaking territories, Jamaica has experienced the epidemiological transition and the chronic non-communicable diseases are now the leading causes of mortality (45). In the 1990s, a cohort study of adults ages 25–74 years in Spanish Town showed the high prevalence of hypertension, diabetes mellitus and obesity, and the significant association between overweight/obesity with both hypertension and diabetes and between salt excretion (proxy for salt intake) and hypertension (46, 47).

In 2000, a National Lifestyle Survey was conducted to determine the national prevalence of the chronic non-communicable diseases and to identify the associated risk factors, including diet and behaviour in the population ages 15–74 years of age [4839] (48). The study found a high prevalence of diabetes and hypertension and risk factors for cardiovascular disease: high levels of total cholesterol, 30% males and 60% of females were overweight or obese, 29% of males smoked and 36% of the population did not engage in any leisure time physical activity.

The findings from this most recent study guided the development of the National Policy and Strategic Plan for the Promotion of Healthy Lifestyles and provided valuable data in the preparation of the National Health Fund's programme which provides medication for persons with selected chronic diseases and supports interventions to promote healthy behaviours. These data also provided the baseline measures and indicators for the monitoring and evaluation of interventions.

Health and Tourism

Traveller's Diarrhoea (TD) is a self-limiting illness that usually resolves spontaneously in a few days, but has the potential to wreck a well-planned business or pleasure trip. It was estimated in 1981 that TD had an incidence rate of 20–50% per two-week stay. During the early 1990s with increase in travel, changes in the tourism industry globally and major outbreaks of TD at large hotels in Jamaica resulting in threats of law suits and adverse travel advisories, we participated in a multi-country study to assess the aetiology and epidemiology of TD, the cost implications, the impact on the quality of life of the traveller and the effect of treatment and prophylaxis on the illness. It also sought to determine the possible benefits from vaccines for the pathogenic agents associated with TD. The study was conducted at 10 large hotels in the Montego Bay area on guests reporting to the Nurses station with diarrhoea (questionnaire, medical and laboratory examination and treatment were administered by the study physician). Airport study questionnaires in one of six languages were also administered to departing passengers over the age of 16 years. Traveller's diarrhoea attack rates were found to be high, 23.6% (highest at all inclusive hotels) and caused 50% of the affected travellers to be incapacitated for a mean of 10.8 hrs. Pathogens were isolated in 31.7% of cases. *Enterotoxigenic E coli* (ETEC) was the commonest pathogen found (49).

The study confirmed that TD was a major problem affecting visitors to the island and that the ETEC and rotavirus vaccines would not be a useful intervention in the prevention of TD in Jamaica. This led to the development and implementation of a programme to prevent the occurrence of TD. The programme included a hotel-based illness surveillance system, new standards for environmental health and food safety, accompanied by structured training for hotel staff. In the year 2000, these standards were incorporated into regulations under the Public Health Act. Between 1995 and 2002, TD incidence rates fell by 72% (50, 51).

The following sections look at the approach issues which we think contributed to the success of the process over the period.

Collaboration between the Ministry of Health (MOH) and the University of the West Indies

A key feature in the implementation of the Ministry of Health's research agenda has been the collaborative relationship between the Ministry and the University of The West Indies, especially the Faculties of Medical Sciences and Social Sciences. This process has been mutually beneficial to both institutions. The technical team in the MOH brought their practical experience, their access to the health team and a network of health facilities, as well as other governmental institutions whose cooperation would be critical to investigation, policy development and policy implementation. The UWI team provided technical and academic acumen, with

links to other international centres of research excellence which ensured that the investigative strategies were of high standard in keeping with current developments in a wide range of areas. Postgraduate students needing research projects and experience were able to participate in projects which addressed critical issues vital to the nation's development.

Study development

It is important that care is taken in the development of the study hypothesis, objectives and design, with diligent review of the literature, including the grey literature and listening carefully to those who have experience in the particular area to be studied. The value of selecting a technically strong study team who are committed and trained to ensure they have good communication and interpersonal skills must be underscored. As funding for research is not usually readily available, one must develop good skills in proposal writing and fund raising, always seeking to utilize opportunities that may arise to include the research question(s) into projects that have been or will be funded. It is also essential to try to keep all the key partners/players involved and informed at all stages of the development of the study.

Study implementation

During the implementation phase it is necessary that resources be made available to the study team in a timely manner to ensure the maintenance of quality and timely research. Do not hesitate to pull in additional technical resources from local or overseas that may strengthen the skills of the study team. The leadership must be vigilant, anticipating and finding solutions to problems promptly. This calls for good communication channels between the study leadership, supervisors and the other members of the team.

Study dissemination and Integrating into Policy and Programmes

It is essential to provide regular feedback to the study team and all partners, collaborators and persons who may be interested in incorporating the findings into policies or programmes. The timely preparation of final study reports and papers for publication is essential to maintaining the cooperative spirit and interest and will ensure that stakeholders remain receptive to future programmes. In addition, the findings must be marketed to the important target audiences, including the media and lay public, if they are to be ultimately used in/or to influence policy and programme development. Changing human behaviour is a slow process and therefore integration of the important research findings into policies and programmes may take several years. This will require perseverance and hard work, constantly seeking and seizing opportunities to influence the necessary changes as supported by the evidence from the research.

CONCLUSIONS

We have tried to identify some lessons learnt over the last two or more decades of practice in public health that has facilitated the development of good research and the integration of the findings into policies and programmes. Collaboration, remaining constantly alert to opportunities for incorporating research into programmes, good communication and patience have been key features of this success over the years. Developing countries must capitalize on scarce assets to ensure that policies and programmes are developed from their own evidence to ensure value for the taxpayer's investment.

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