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"INAGURAL ISSUE"

IN THIS ISSUE

ABOUT THIS JOURNAL

The **FJPH**, is a Fiji based Journal published for Public Health practitioners, public health researchers, clinicians and all allied health practitioners. Our goal is to provide evidence based information and analysis they need to enable them to make the right choices and decisions concerning their health and health services provided to ensure better health for all.

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The format of **FJPH** accommodates three types of submissions:

1. Original Academic/Scientific Research Papers – Research-based works addressing a specific area of public health or any other general topic in health- between 3,000 and 4,500 words.
2. Structured Abstracts- for original research & systematic reviews of specific public health interest - between 500 and 3,000 words.
3. Perspectives –Reviews, Opinion pieces that analyze or discuss a recent issue or development in public health - between 250 and 2,500 words.
4. Field notes –Journal-style pieces, with a more personal voice, based on direct work in the field –between 200 and 2000 words.
5. Submission Procedures
6. All manuscripts should be prepared according to the guidelines below
7. The call for submissions and a description of the optional theme can be found in the Health Research web page.
8. All manuscripts should be submitted via the online submissions form on the Research web page.
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10. For each manuscript, at least one of the authors needs to be an undergraduate, medical, or graduate student at a nationally accredited institution.
11. The submitted manuscript has not been published nor will be published in another publication at the undergraduate, graduate or professional level.
12. The manuscript is the authors' own original work, and the authors are the sole authors of the manuscript.
13. The primary author is willing and able to work with FJPH editors in revising the submission if it is selected as a likely candidate for publication.
14. Submission Types
15. Original Scientific Research Papers – Research-based works addressing a specific area of public health or any other general topic in health
16. Abstracts – structured abstracts for original research and systematic reviews of specific public health interest.
17. Perspectives –Reviews, Opinion pieces that analyze or discuss a recent issue or development in public health
18. Field notes –Journal-style pieces, with a more personal voice, based on direct work in the field

PREPARATION OF MANUSCRIPTS

Formatting

- All manuscripts should be submitted as double-spaced, size 12, Times New Roman font in Microsoft Word format (.doc or .docx only).
- Do not include the name of the manuscript's authors any pages except the title page.

Content Guidelines for Perspectives and Field Notes

Perspectives are opinion-based pieces. Field Notes take a more personal, informal tone that addresses public health work the author has done in the field. For both Perspectives and Field Notes, we are looking for submissions that address fresh and exciting developments in public health from an interdisciplinary perspective. Perspectives and Field Notes should be grounded in the preexisting literature base. For citations and references, please use APA style. If tables and figures are used, please include them at the end of the submission.

Content Guidelines for Original Academic/Scientific Research Papers

The appropriate structure of Academic/Scientific Research Papers varies based on the topic of the manuscript. With a few exceptions, most Academic/Scientific Research Papers should have the following sections: a) Abstract, b)Introduction, c) Methods, d) Results, e) Discussion, f) Acknowledgments and References, g) Tables and Figures.

Tables, Figures and Images

- Tables, figures and images should be the original work of the manuscript's authors and should be included at the end of each manuscript.
- Captions should describe what the table/figure/image shows and the conclusion that should be drawn.
- Labels and axes should be clearly marked and readable. All tables, figures, and images should be submitted in high resolution please.
- References
- You can find resources on the use of APA style at the APA Style Guide.

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GUEST EDITORIAL Neil Sharma
Minister for Health

Research and Publication make healthy partners in Healthcare Delivery.

The arrival of this National Public Health Publication falls wonderfully in place with the current overarching framework addressing "Wellness".

With an established Health Policy Planning, Budget Analysis Unit sitting on the operational four legged framework of Statistics Epidemiology Information Technology and Research, supported by an adequately powered Health Accounts groups we envisioned real time healthcare developments.

Cumulative data will be converted into informational evidence and health policy will become interventional.

Research and Publication remains a new culture in the Pacific which needs nurturing. I compliment the whole pioneering team including the researchers, peer reviewers, editorial board and the editor for this bold step. May this Public Health Journal carry Fiji's Public Health Flag into the Blue Continent and beyond.

EDITOR IN CHIEF Josefa Koroivueta
Deputy Secretary, Public Health

The array of contributions in this inaugural issue, show the wealth of public health concerns in Fiji. It mixes diabetic sepsis, gynecological cancers, decentralization, evidence based decision making, communicable diseases, and climate change. Fiji has to foster the shift of culture to support evidence-informed decision-making that informs all policies that have potential health benefits. The TROPIC project is a good ambassador of the needed change.

The NCD's crisis in Fiji brings to reality where healthcare deliver ought to concentrate evidence based interventions. It has to be, to minimize the defined impacts at individual, household, community and national level. The common complication of diabetes, diabetes sepsis is reviewed to show upublished facts . Around 300 limb amputations are undertaken annually and there are dreadful impacts of diabetes.

Diabetes complications contributes to disability and poverty. Poor control of diabetes leads to sepsis should be targeted to prevent complications. A high quality footcare is an investment to prevent diabetic sepsis.

Decentralisation approach serves to embrace universal coverage and providing accessibility of care to the community at large. It is a changing frontier in health, one that requires good monitoring and evaluation to address short and long terms gaps in its evolution.

The communicable diseases continue to trouble us even though they do not match proportionately to the burden of NCD's. They haunt us in between disasters and post disasters.

Climate Sensitive Diseases is a new label for the reemergence of dengue, leptospirosis, typhoid fever and diarrheal diseases. To deal with them requires a robust approach involving all sectors of the community and being attentive to identifiable factors to mitigate the impact of climate change. It is here to stay and cannot be ignored in our health care business.

I encourage public health professionals to pursue research with hunger and to take the giant leap to publish their work. We need to be objects of success not derision.

Time for Reflection:

The story of a physician trying to explain the dilemmas of the modern practice of medicine....

"You know", sometimes it feels like this.There I am standing by the shore of a swiftly flowing river and hear the cry of a drowning man. So I jump into the river, put my arms around him, pull him to shore and apply artificial respiration and then just as he begins to breathe, another cry for help.

You know, I am so busy jumping in, pulling them to shore, applying artificial respiration, that I have no time to see who the hell is upstream pushing them all in".

Irving Zola 1970

DECENTRALIZATION OF GENERAL OUTPATIENT SERVICES FROM THE COLONIAL WAR MEMORIAL HOSPITAL TO THE HEALTH CENTRES IN THE SUVA SUBDIVISION

Nand D[1]*

Keywords: Decentralization, General Outpatient, Suva, Fiji

ABSTRACT

Patient choice forms a key part of health service improvement and forms a major determinant in patient health care delivery. At a time when the population of Fiji has access to 24 hour banking services and extended supermarket services, the outpatient services at health centres remained in the eight hour access, from 8am to 4.30pm.

The Valelevu, Makoi and Raiwaqa health centres have been providing extension of service hours from 6.30am to 10pm on weekdays and 8am to 4pm on weekends, from 2nd March and 15th April, 2009, respectively. This concept is to be extended to all six health centres in the Suva Sub-division from the 31st of January 2011.

Decentralization is about making services more accessible to the community, in other words, bringing the services closer to where people reside. A study of the health facilities in the Suva Sub-division are provided with statistical analysis and needs for future expansion of health facilities with the necessary infrastructural improvements or developments, staffing and medical supplies. The report provides recommendations to operationalizing the decentralization process by 46.4%. The average number of patient arrivals for year 2010 was 7637 patients per month (251 patients/day) and for 2011 it was 4095 patients per month (135 patients/day). In 2010 the trend for patient arrivals has been a plateau whereas in 2011 a gradual decline reaching to a steady state of patient arrivals from September till the month of December was seen.

INTRODUCTION

Decentralization of the general outpatient services from the CWMH to nearby health centres is a major initiative of the Honourable Minister for Health. This was arrived through intensive consultation with the health professional and the community at large, belonging to the Suva-Nasinu corridor. The decentralization concept translates into extended service hours for the six health centres in the Suva Sub-Division. The extension sees the health centres opening from 6.30am to 10pm on weekdays and 8am to 4pm on weekends. This is in contrast to the previous service hours from 8am to 4.30pm on weekdays only.

A study (Feeney et al., 2005) in the United Kingdom which surveyed 265 people to determine the need for out of normal clinic and weekend hour preferences revealed that 63% preferred extension of service hours.

This patient choice theme was an impetus to the current extension of service hours at the Valelevu, Makoi and Raiwaqa health centres. The Minister for Health revealed that in the areas of service delivery the initiative to open health centres had helped reduce stress on the CWM hospital, in the A&E and GOPD sections by 30%. He also added that this placed the doctors at the hospital in better positions to care for the acutely sick.

However, the service extension has to be evaluated on the basis of the effects of the extension on human resource capacity, administrative capacity, skill level, infrastructure, finance, equipment and consumables, and stress levels to fully understand the implications of the service extension on delivery of services and on the workforce who are achieving health outputs.

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Statistics

The 2007 Census report noted that Fiji had a total population of 837 271, out of which 51% inhabited the urban centres. The report further stated that the total increase in the urban population was most entirely due to the incorporation of Nasinu town which had a population of 76 064. The incorporation of Nasinu town accounted for 73% of increase in the city/town population. Furthermore, Nasinu Urban Area is considered the largest urban area, larger than Suva city [74 481] and Lautoka city [43 473] (Fiji Islands Bureau of Statistics, 2007). In addition, over the last decade the population increase was on average 0.7 per cent per year (Fiji Islands Bureau of Statistics, 2007).

Therefore the delivery of health services to this urban population is an important consideration as a determinant of health status for those residing in the urban centres, particularly – the Suva-Nasinu Corridor. The provision for these health services is through both general practitioners and government owned health centres. The Suva Sub-division is an integrated network provider consisting of both private and state owned service providers.

Human Resource Capacity

Optimizing health care delivery largely depends on the adequacy of human resource capacity in the health arena. Martinez and Martineau (2002) maintain that effective coverage of health care is determined by the ability of the health sector to attract staff both into training and into the health service. Equitable distribution is in turn maintained by prospects of career progression and incentive packages associated with posts. The report by S. Tagilala (2005) supports these views and emphasizes the implications of human resource inadequacy due to losses. These implications include:

- Sub- standards level of service delivery to the general public
- Financial losses in training and retraining staff to fill the void
- Costs incurred in recruiting and hiring foreign professionals, who are ultimately unfamiliar with our health sector
- Consistent level of shortages where the workforce is subjected to very high job involvement and intensity levels that is awarded with substandard financial rewards and working conditions.

The implication on health centre extension service provision is the quantity of patients catered for by the limited resource personnel available. The regular catchment population served and the extension of services to other populace, who do not have the same service in their respective areas, implies that the health centres operating under the new service hours will be inundated by these populations for service delivery. The expectation would be of prompt service delivery; the dilemma is the adequacy of staffing for service delivery.

Skills

The skills available to the workforce enable the magnitude of quality care provision. The instigation of on-going professional competency and practice evaluation is a method of ensuring quality standards in health care delivery. Kabene et al. (2006) implicate human resources as responsible for individual and public health intervention. Human resource personnel composition should be evaluated in terms of both skill categories and training levels. Kabene et al. (2006) stresses the importance of education and in-service training of health care workers to ensure effective service delivery.

The up-skilling of staff for service provision is an imperative to enable optimal outputs. As mentioned by Joseph et al. (1981) there was quality of care compromise with a large patient load. Emphasis was placed on restructuring of services and working patterns; appropriate skills and competence to manage patients were stressed to achieve quality of care outputs.

Finance

Financing of the health sector in Fiji is almost solely provisioned for by the government coffers (Pande, 2003). Pande further emphasizes the need for collecting information on: organizational design; range of service provision; personnel involved in delivery of services; accurate account of financial

expenditure; physical resources; demographic spread of populations; epidemiological profile; household spending of target population; and social factors to enable explorations on financing options for the health system.

Kabene et al 2006 emphasizes that both the number and cost of health care consumables are rising astronomically, which in turn drastically increases the cost of health care. In publically funded systems, expenditures in this area can affect the ability to hire and sustain effective practitioners.

The sustainability of health service provision is wholly dependent on finance. This is relevant to the extension of services at the Valelevu, Makoi and Raiwaqa Health Centres. The extension puts more financial pressure on the centre to provide services within the current budget and resource provisions. As Pande (2003) suggests, the multi factorial aspects of health care should be examined to allow for cost ascertainment of health care delivery versus service outputs.

Policy

Health policy and planning are fundamental conditions for better performance of health systems (World Health Report, 1993). These policy designs include human resource policy initiatives to enable better service delivery (Rigoli & Dussault, 2003). The implications of service extension is to design and implement of policies in line with extension of service provision; delineating the roles, responsibilities, finance and resource acquisitions with the extension. The concept of monitoring and evaluating the needs with health service utilization is an imperative to delivery of quality health care.

METHODOLOGY

The six health centres were evaluated on the basis of: staffing; equipment; consumables; administration and infrastructure. These components were essential to the operationalization of the extended hours from the normal 8 hour weekday shifts.

The study utilized both quantitative and qualitative methods to gather information to realize the concept of decentralization of the general outpatient services from the CWMH to the Suva Sub-divisional health centres. There were consultations with both the CWMH and the Suva Sub-divisional team to ensure the smooth operationalization of the decentralization concept. Utilization of both secondary data and gathering of primary information was undertaken. Referral to PATIS, PHIS and the CMR's were also included for data collection. The registers had to be utilized in cases where outpatient figures were unavailable. Analyses were done using Excel 6.0.

RESULTS & DISCUSSION

Brief Analysis

The health centres function and provides services under different conditions. These include the number of staff, the catchment populations, the services rendered at the facility, the work environment or infrastructure the equipment and administration support available and the ancillary support available.

The Valelevu health centre covers the greatest population and also has the greatest service utilization in the Suva Sub-Division. This is closely followed by the Makoi health centre. However, the other health centres will need to be closely monitored to understand the pattern of service utilization and subsequently the need for increase of resources or infrastructural considerations.

Staffing

The staffing allocations for the medical officer, nurse practitioner, medical assistant, nursing, allied health administration and cleaners were recommended to be increased with reference to the catchment population, outpatient numbers and services provided by the health centres. The Clinical Services Plan Package was utilized as a reference for role delineation, staffing, infrastructure and equipment standards for this exercise.

Infrastructure

Modifications to the current structure were recommended for the Nuffield, Lami, Makoi,

Valelevu, Raiwaqa and Samabula health centres. These infrastructural improvements included an emergency bay set up at Raiwaqa health centre. Laboratory and radiography/ ultrasonography inclusions to the health centres. Minor modifications to the structures were recommended to accommodate for IMCI clinics and other outpatient services.

There is a need to look at relocating health centres which have no provision for expansion. The need for expansion is to be based on the urban growth projections for the area.

Consumables/Medications

The recommendation was to increase allocations by at least one and a half the allotted quantity and to monitor the utilization of consumables and equipment over the next three months. The ordering for all the health centres was regularized to a monthly system instead of the previous quarterly system.

Equipment/Administration

Equipment audit was undertaken and all equipments were procured in line with the Clinical Service Package recommendations. All equipment was recommended to be serviced by the biomedical team. Extra equipment acquisition was recommended on the basis of the outpatient numbers and the services rendered.

CONCLUSION

Local research is deficient on evaluation of extension of hours of service provision. This inadvertently signals a need for both quantitative and qualitative research into this arena, as there is an obvious research gap. There is also a need for updated data for catchment populations. The data that was available had not been updated within the last five years. There is an urgent need to set up a database for health service utilization in the Suva Sub-division and to use this data for evidence based management.

The extension of service provision, in terms of extension of hours of service invites scrutiny on the areas that are involved in service delivery. These areas include: Human resources (number and labour differentiation); Skills; Medical supplies and consumables; Equipment; Infrastructure; Finance and Policy.

These variables ultimately impact on service delivery and evaluation of the service provision imperatively considers these variables. An evident research gap exists as Ministry of Health – Fiji has embarked on a new venture from March 2009, namely the extension of service hours at the six health centres under study.

A follow up paper on the evaluation of the operations of the six health centres and the GOPD and A&E components will be available in the next issue.

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CLIMATE CHANGE AND HEALTH IN FIJI: ENVIRONMENTAL EPIDEMIOLOGY OF INFECTIOUS DISEASES AND POTENTIAL FOR CLIMATE-BASED EARLY WARNING SYSTEMS

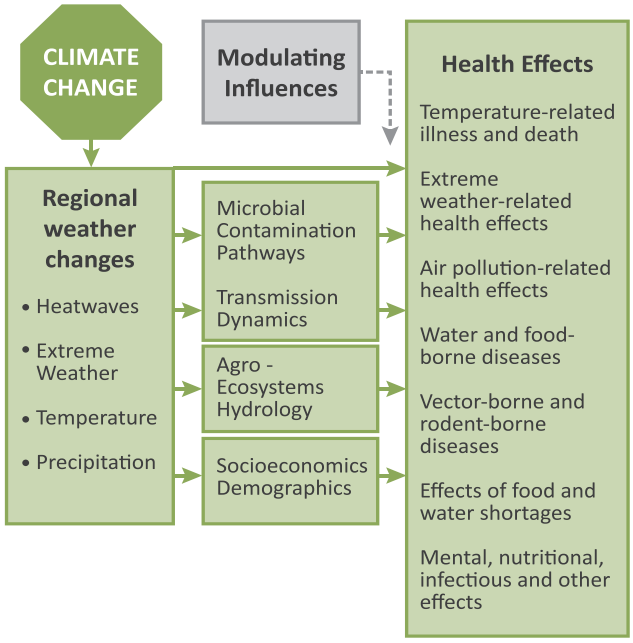
McIver LJ[1,2,] Naicker J[1,2], Hales S[3], Singh S[1] and Dawainavesi A[1,2]*

Keywords: climate change, climate-sensitive disease, early warning system

INTRODUCTION

The health impacts of climate change are cause for growing public health concern around the world. Anthropogenic (human-induced) changes in the physical environment due to global greenhouse gas emissions include rising air and sea-surface temperatures, altered rainfall patterns and rising sea levels; these phenomena are linked to health outcomes via a number of complex, direct and indirect pathways (*see Figure 1*). While *Figure 1* demonstrates some of the important relationships between climatic factors (e.g. rainfall, temperature) and health effects, it is important to note that some of the most significant effects of climate change in the Pacific region, such as sea-level rise (which may, for example, impact on health by exacerbating overcrowding, cause mental health problems due to population displacement and lead to poor nutrition via effects on agriculture), are not included in the diagram.

Figure 1. *Climate change and health linkages (adapted from Patz et al, 2000)*



In 2004, the World Health Organization (WHO) supported a "Global Burden of Disease" assessment which estimated the annual mortality burden due to a range of diseases and exposures. The health impacts of climate change were included in this assessment and it was estimated that approximately 150 000 – 200 000 deaths worldwide, each year, were attributable to the effects of climate change (Kovats et al, 2005).

As can be seen in *Figure 1*, the health impacts of climate change include (but are not limited to): increased burden of water-, food- and vector-borne diseases; traumatic injuries and deaths from extreme weather events; increased burden of respiratory illnesses (due to infective causes and obstructive airways diseases); increased mental health problems (from loss of land, livelihoods and population displacement, as well as the mental health impact of natural disasters); compromised food security (leading to malnutrition) and heat-related illnesses. It is important to note that these problems will be borne disproportionately by certain vulnerable sectors of the population – the very poor, young children, the elderly, people with disabilities, people with preexisting illnesses (e.g. non-communicable diseases) and certain occupations (e.g. farmers, fishermen, outdoor workers) (Sheffield et al., 2011; McMichael, 2009).

In the Pacific, the region's Health Ministers identified climate change and health as a key priority area at their 2009 meeting in Madang, Papua New Guinea, where they committed to, inter alia: assessing health vulnerabilities to climate change, strengthening health systems to manage the impacts of climate change and mobilizing communities to increase their resilience to these effects (Madang Commitment, 2009).

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Fiji is involved in a seven-country global project, supported by WHO and the United Nations Development Programme (UNDP) with funding from the Global Environment Facility (GEF), entitled "Piloting Climate Change Adaptation to Protect Human Health" (PCCAPHH). This project aims to enhance the capacity of Fiji's health sector to anticipate and respond effectively to four priority climate-sensitive diseases (CSDs): dengue fever, typhoid fever, leptospirosis and diarrhoeal disease. These CSDs are major public health concerns in Fiji.

This paper summarises the methodology, results and implications of the PCCPAHH project's work to date examining the relationship between these diseases (the so-called "plagues" of Fiji) and climate variability in Fiji.

METHODOLOGY

The majority of the analytical work on the PCCAPHH project to date has focused on the construction of a climate-based early warning system (EWS) to provide timely information about possible epidemics of the aforementioned diseases. This process involved analysing the available data on climate (provided by the Fiji Meteorological Service) and CSD cases (from the National Notifiable Diseases Surveillance System - NNDSS), which was carried out via the following steps:

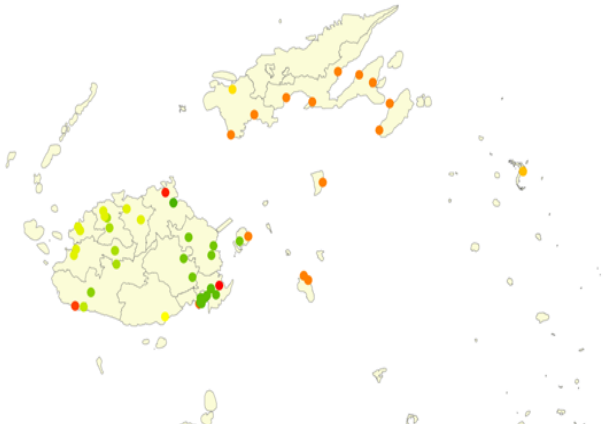
1. Calculation of historical disease incidence rates using NNDSS case numbers and Ministry of Health (MoH) population data.
2. Simple correlation (two-way scatterplots with straight lines-of-best-fit and summed residuals) of disease numbers and incidence with climate data, including:
   a. National level: annual aggregate disease numbers and annual averages of climate data from 1957 to 2009; and
   b. Subdivisional level: monthly aggregate disease numbers and monthly averages of climate data from 1995 to 2009.
3. Identification of disease "clusters" (patterns of unusual disease activity in a given area at a given time) at the medical area level between 1995 and 2009, using SaTScan (a space-time analysis software package) and geographic information systems (GIS) technology to locate health centres and hospitals ("medical areas" within subdivisions).
4. Identification of CSD "hotspots" – areas (at the subdivisional and medical area level) where two or more of the four priority diseases occurred at higher-than-average incidence, or in two or more clusters over the study period, or both.
5. Detailed analysis of CSD and climate data in "hotspot" subdivisions, using Stata (a statistical analysis software package) to perform time-series analysis, Poisson regression and lag functions.

RESULTS

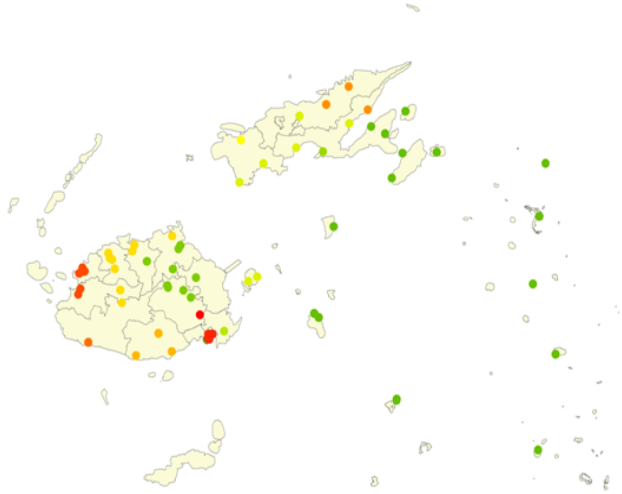
Review of the historical incidence patterns for the aforementioned diseases confirmed the epidemicity of dengue fever in Fiji and appeared to show alarming trends towards increasing incidence of both leptospirosis and typhoid, while diarrhoeal disease incidence showed no particular trend.

Space-time analysis of each of the four diseases over three five-year periods between 1995 and 2009 showed distinct "clustering", as displayed in *Figures 2a-2d.* In this series of figures, each dot represents a "medical area" (as defined by the Fiji MoH) and each group of dots of the same colour represents a statistically significant "cluster" of cases in a circumscribed geographic region (medical areas reasonably close to each other) at a given time during the study period.

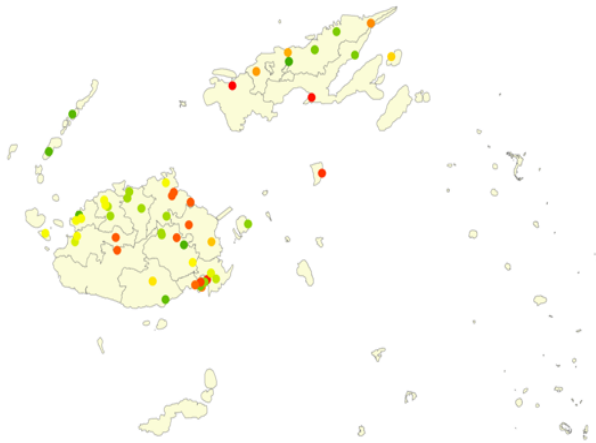
2a. Dengue fever "clusters" in Fiji (1995-2009)



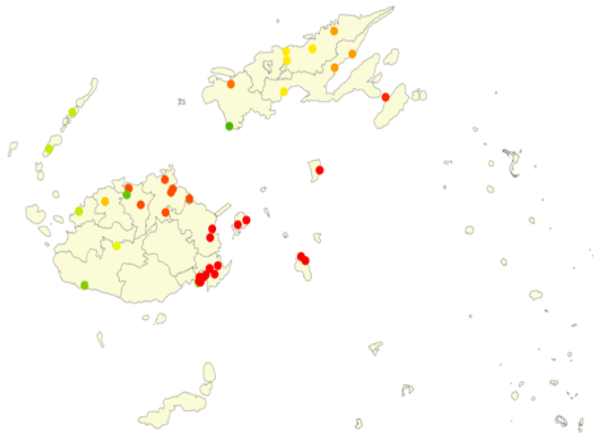
2b. Leptospirosis "clusters" in Fiji (1995-2009)



2c. Typhoid "clusters" in Fiji (1995-2009)



2d. Typhoid "clusters" in Fiji (1995-2009)



The process of reviewing historical incidence patterns and space-time clustering of the four diseases led to identification of a shortlist of "hotspot" subdivisions, which appeared to have increased burden of two or more of the CSDs in question. This list included Ba, Bua, Macuata, Ra, Suva, Tailevu, Tavua and Vunidawa. From this list, the two final "pilot site" subdivisions of Ba and Suva were selected for more detailed analysis of the relationship between climate and disease, via time-series and Poisson regression techniques.

Some examples of the intermediate outputs of this analysis process are displayed below in *Figure 3* (graphical time-series of leptospirosis, temperature and rainfall in Ba) and *Figure 4* (correlation of rainfall with diarrhoeal disease in Suva). A summary of the results of modeling monthly climate variables with monthly cases of diseases in the two subdivisions is presented in *Table 1*.

* The "model" line in each row gives the correlation coefficient for the "best" model combining the climate variables at monthly lags which give the highest correlation coefficient
** All results displayed significant to the p≤0.05 level.

Figure 3. *Monthly leptospirosis cases and climate (average maximum and minimum monthly temperatures in degrees Celsius; monthly rainfall in millimetres) in Ba subdivision (1995-2009)*

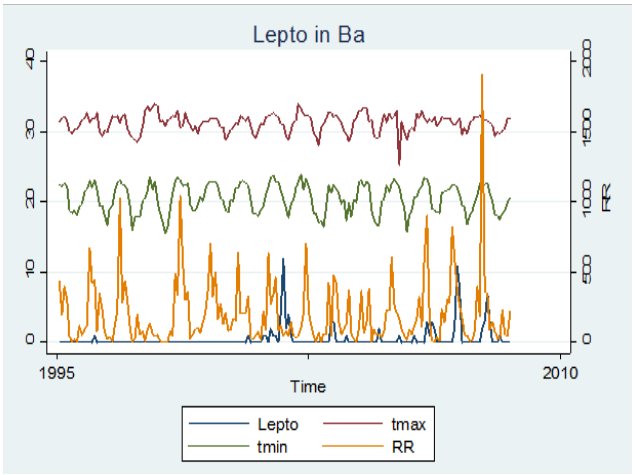
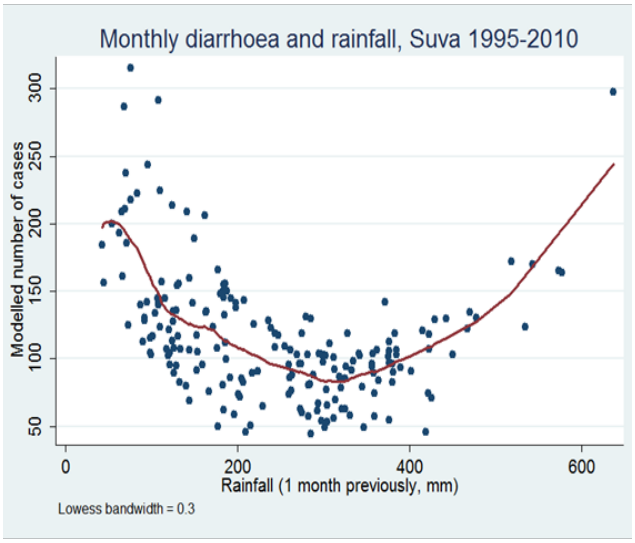


Table 1. *Relationship between monthly climate variables (rainfall, maximum temperature, minimum temperature and humidity) at lags of up to three months with monthly cases of CSD's (1995-2009)*

Disease	Subdivision	Climate variables/model*	Strength of association (pseudo-r2 value)**
Dengue	Ba	Rainfall- lag 1,2,3 Maxtemp- lag 0,1,2,3 Mintemp- lag 2 Humidity- lag 1	0.3, 0.27, 0.32 0.29, 0.38, 0.32, 0.29 0.25 0.34
		Model: rainfall, maxtemp, humidity at lag-1	0.39
	Bua	Rainfall - lag 0,1,2, Maxtemp- lag 0,2,3 Mintemp- lag 0,1,2,3 Humidity- lag 0	0.4, 0.3, 0.37 0.37, 0.33, 0.31 0.35, 0.30, 0.32, 0.31 0.33
		Model: rainfall, maxtemp, mintemp at lag-0	0.52
	Lautoka	Rainfall- lag 1 Maxtemp- lag 1 Mintemp- lag 1	0.42 0.53 0.27
		Model: combination of three lagged climate variables above	0.54
	Suva	Rainfall- lag 2 Maxtemp- lag 3 Mintemp- lag 0,2 Humidity- lag 2	0.47 0.50 0.57, 0.52 0.47
		Model: all four climvar's at lag-2	0.6
Diarrhoeal illness	Ba	Rainfall- lag 1 Maxtemp- lag 3 Mintemp- lag 3 Humidity- lag 1	0.1 0.06 0.07 0.14
		Model: model with all four lagged climvar's above	0.17
	Bua	Rainfall- lag 0 Maxtemp- lag 0,1,2, Mintemp- lag 0-3 Humidity- lag 2	0.12 all ~0.10 all ~0.10 0.12
		Model: rainfall, maxtemp, mintemp at lag-0	0.13
	Suva	Rainfall- lag 1,3 Maxtemp- lag 0,3 Mintemp- lag 3	~0.4 " "
		Model: three climvar's above at lag-3	0.41
Leptospirosis	Ba	Rainfall- lag 2 Maxtemp- lag 1,2 Humidity- lag 1,2	0.3 0.32, 0.30 0.3, 0.3
		Model: rainfall lag -2, mintemp lag-1	0.35
	Bua	Rainfall- lag 0,2,3 Maxtemp- lag 0,3 Mintemp- lag 0,1,2,3 Humidity- lag 0,1	0.42, 0.4, 0.48 0.38, 0.45 0.4(all) 0.45, 0.40
		Model: rainfall, maxtemp, mintemp at lag-3	0.59
Typhoid	Ba	Rainfall- lag 1,2,3 Maxtemp- lag 0,3 Mintemp- lag 1,2,3 Humidity- lag 0,1,2,3	0.47, 0.63, 0.49 0.47, 0.49 0.46, 0.52, 0.46 0.48, 0.46, 0.47, 0.5
		Model: rainfall, mintemp at lag-2	0.66
	Bua	Rainfall- lag 0 Mintemp- lag 0,3 Humidity- lag 3	0.35 0.36, 0.36 0.35

Figure 4. *Monthly cases of diarrhoea vs monthly rainfall (lagged by 1 month) in Suva, based on a Poisson regression model. (NB. Solid red line is a Lowess smooth illustrating a typical "U-shaped" relationship).*



Given the particular vulnerability of the Western Division to extreme weather events such as floods and droughts, additional modeling of the relationships between events such as tropical depressions, floods and droughts and cases of CSD's was undertaken for Ba subdivision. This analysis showed significant relationships between these events and epidemics of dengue fever and diarrhoeal disease in the subsequent month. These findings are presented as odds ratios in *Table 2.*

Table 2. *Odds ratios of CSD outbreaks in the month following extreme weather events in Ba subdivision*

Extreme weather event	Odds ratio (OR)* of CSD outbreak in the month following the event
Drought	Dengue fever: OR = 5.17 Diarrhoeal disease: OR = 9.0
Floods caused by tropical depressions	Dengue fever: OR = 10.57
All Floods	Diarrhoeal disease: OR = 3.5

* All results displayed significant to the p≤0.05 level

DISCUSSION

The PCCAPHH project's work described above examining the relationship between climate variables and cases of four CSDs has discerned some correlations between monthly temperature, rainfall, humidity and extreme weather events and monthly cases of leptospirosis, typhoid fever, dengue fever and diarrhoeal disease in several regions of Fiji.

This analysis builds on earlier work in the Pacific and elsewhere investigating the relationships between climatic factors and infectious diseases, including:

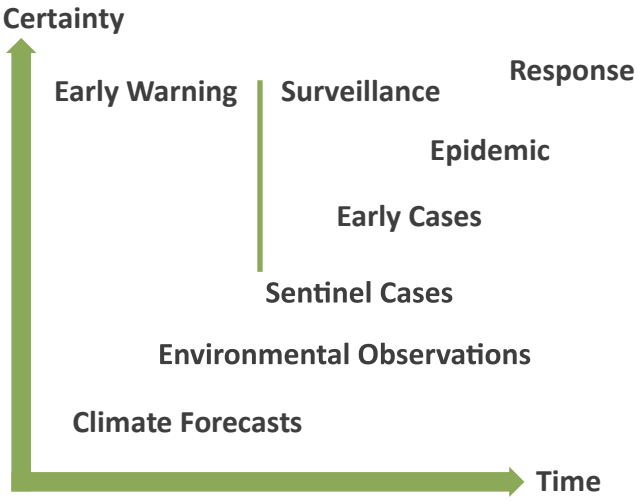
- modeling of dengue fever in the South Pacific showing a positive correlation between monthly temperature and rainfall, La Niña years and dengue fever outbreaks in ten countries, including Fiji (Hales et al., 1999), with comparable findings reported in several other regions of the world such as the Caribbean (Depradine et al., 2004), South America (Chowell et al., 2011) and South-East Asia (Thai et al., 2010);
- a well-known study of diarrhoea in infants in Fiji showing a positive association between incidence of diarrhoea, extremes of rainfall and increasing temperature (Singh et al., 2001), a finding consistent with earlier work in Peru (Checkely et al., 2000) and Bangladesh (Hashizume et al., 2008)
- the observation that Fiji experiences outbreaks of leptospirosis after cyclones, with generation of the hypothesis that this correlates with the corresponding increase in agrarian activities that takes place following a natural disaster (Ghosh et al., 2010), noting that this is consistent with some published studies reporting higher rates of leptospirosis following rainfall elsewhere in the tropics (Lhomme et al., 1996, Desvars et al., 2011).

The empirical modeling to date indicates that, given the observed lag between the exposure (climate variables) and the outcome (monthly cases of disease), it may be possible to use climate

information (including forecasts) to predict epidemics of these four important communicable diseases in Fiji. This idea has a long history, with models pioneering the incorporation of rainfall into malaria early warning systems in India dating back almost a century (Gill, 1923). The process of compiling such models, including key components and steps for testing and evaluation, has been well described elsewhere (Campbell-Lendrum, 2005).

While, clearly, the explanatory power of climatic factors in predicting CSD epidemics is typically small, and myriad other factors (such as population movements, herd immunity, vector abundance and behaviour to name just a few) all form part of a more complete, biological or "mechanistic" model of disease, nevertheless the ability to use climate data to add an extra, "upstream" layer to standard disease prevention, surveillance and response capacity may prove valuable in the Fiji public health context (***see Figure 5***).

Figure 5. *Early warning systems adding value to traditional disease surveillance (WHO, 2008)*



It must be made clear, however, that both the analyses above and the potential for these to inform any prospective disease early warning systems are limited by the quality and quantity of the data, particularly the health data.

One of the major issues is the mismatch between the notified () and the laboratory-confirmed case data for these and other diseases (including influenza). This is a well-recognised problem in Fiji, resulting from the gradual strengthening of the laboratory diagnostic capacity in the country (which lies predominantly within the National Centre for Communicable Disease Control and the major hospitals) and the inconsistencies in reporting of notifiable diseases, due to problems with case definitions, timeliness of report submissions, the attention given to diseases around the time of outbreaks and other factors. Of particular relevance to this project is the fallibility of the NNDSS in accurately and consistently recording cases of dengue fever, leptospirosis and typhoid fever – all of which can be difficult to diagnose clinically without laboratory confirmation, particularly in the context of an outbreak (which can lead to over-diagnosis of the disease in question due to heightened awareness of patients and clinicians alike, as well as potentially under-diagnosis of diseases with similar clinical presentations, as demonstrated in a study of leptospirosis in patients presenting with dengue-like illnesses in Puerto Rico (Bruce et al., 2005)). It could also be argued that the lack of routine laboratory confirmation of diagnoses of these three diseases prior to approximately 2006 means that there is a genuine lack of information regarding their true incidence in Fiji.

A critical issue in the study of typhoid fever in Fiji is the apparent sudden rise in cases from around 2005-2006. Possible causes for this include: a true increase in the number of cases of typhoid in Fiji, far in excess of that which may be expected due to population growth; increased awareness on the part of the public and/or health professionals about the risk factors, symptoms and clinical picture of typhoid (NB. this may have the effect of either accurately recognising cases which would have previously gone unrecognised, or incorrectly diagnosing non-typhoid cases as typhoid); a lapse in the typhoid vaccination regimen; and antibiotic resistance of the pathogenic organism, among other factors.

There are occasional, unexplained gaps in both the health and climate data utilised so far; it is not clear whether, in the case of the disease data, these represent "no cases" and/or "unreported cases"

(for the climate data presumably a breakdown in communication and/or technology is to blame). There have also been inconsistencies in the manner in which the health data have been recorded over the study period (most likely due to staff turnover); there is the potential – and intention - for this project to contribute towards the standardisation of disease data record-keeping for improved use in the future.

CONCLUSION

Elucidating the relationships between climatic variables such as temperature, rainfall, humidity and extreme weather events and CSDs such as leptospirosis, typhoid fever, dengue fever and diarrhoeal disease in certain regions of Fiji may allow the construction of climate-based early warning systems to reduce the impacts of epidemics of these disease, as well as estimates of their respective future burdens due to climate change. Such a system would ideally form part of a suite of health system strengthening activities as the health sector adapts and increases its own resilience to climate change.

It is hoped that this information may be used to inform public health professionals and communities to reduce the health risks posed by climate variability, extreme weather events and climate change in Fiji.

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THE EFFECT OF DECENTRALIZATION OF HEALTH SERVICE DELIVERY ON ACCIDENT & EMERGENCY (A&E) DEPARTMENT AT COLONIAL WAR MEMORIAL HOSPITAL (CWMH)

Sharma V[1]*

Keywords: Decentralization, Accident & Emergency, CWMH, Fiji

ABSTRACT

This research is a 2 year retrospective study of the patient attendances in A&E, CWM from 1st January 2010 to 31st December 2011 to evaluate the effect of decentralization, which was implemented from the beginning of 2011, on the total number of patients seen by A&E. The total patient attendances for 2010 was 91,649 and for 2011 was 49,136 which was a drastic reduction by 46.4% The average number of patient arrivals for year 2010 was 7637 patients per month (251 patients/day) and for 2011 it was 4095 patients per month (135 patients/day). In 2010 the trend for patient arrivals has been a plateau whereas in 2011 a gradual decline reaching to a steady state of patient arrivals from September till the month of December was seen.

INTRODUCTION

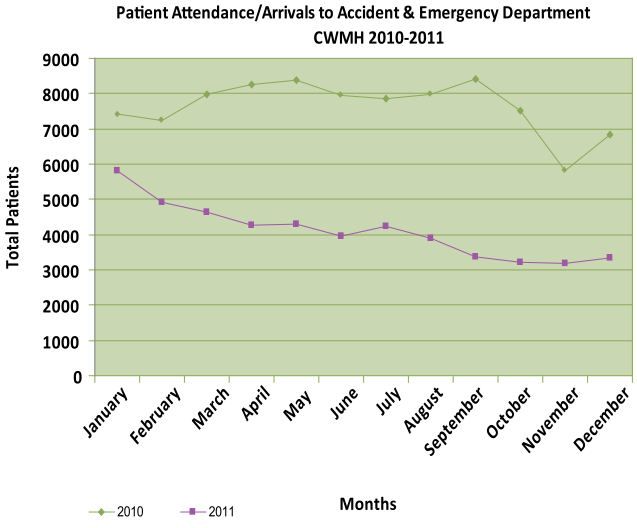
The Accident and Emergency (A&E) Department is the first point of care when a patient arrives to a hospital for assistance in a trauma or health emergency scenario. One very important factor to quality care at A&E is patient attendance or health burden faced at the point of entry which is the A&E department of a hospital. If attendees surpass the capabilities of the service delivery at the entry point then poor health care is the inevitable outcome. Thus the Ministry of Health initiated the decentralization of health services to decrease the load of patients seen in A&E. To evaluate its effect on the patient attendance, this research was conducted over the 2 year period, 2010 (the year before decentralization) and 2011 (year after decentralization) at CWM Hospital .

METHODOLOGY

This is a retrospective study where the information was collected from the PATIS of CWM Hospital for the individual months from 1st January 2010 – 31st December 2011 and converted to Microsoft Word format. Using Microsoft Excel Program data was tabulated and graphs created. The study period was chosen from 1st January 2010 – 31st December 2011 because it would show the immediate effects or trends if any across a 2 year period after the decentralization framework had been made public at the beginning of 2011.

RESULTS/DISCUSSIONS

The total patient attendances were 91,649 and 49,136 for the years 2010 and 2011 respectively. 42,513 fewer patients attended A&E/GOPD CWMH which was a reduction of 46.4% as compared over the two year period. The average number of patient arrivals for year 2010 was 7637 patients per month and for 2011 it was 4095 patients per month. The maximum number per month for patient arrivals to A&E was 8398 and 5803 patients respectively for years 2010 and 2011. Similar trends were seen for the least number of patients seen per month - 5803 in year 2010 and 3185 in year 2011. There was a dramatic fall in patient numbers over the transition phase as can be seen from the graph below.



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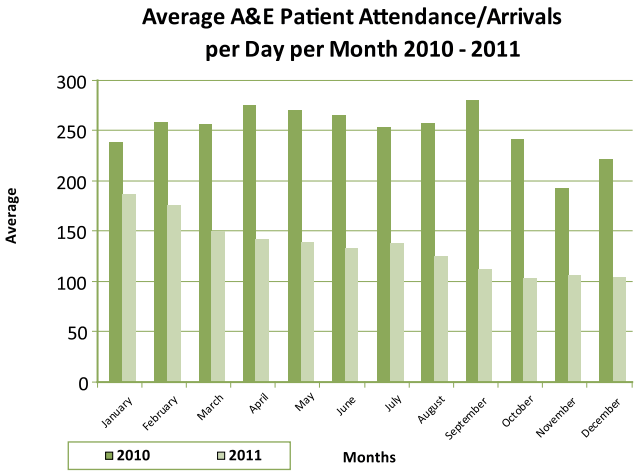
In 2010 the trend for patient arrivals has been a plateau over the one year period but year 2011 has seen a gradual decline reaching to a steady state of patient arrivals from September till the month of December (*refer graph above*). This could be a clear indication towards the Ministry of Health's stance on the decentralization of the health services for patients in the greater Suva – Nausori corridor.

The graph below depicts the average number of patients seen every day for the year 2010 and 2011. There were 251 patients who were seen on daily average in 2010 and an average of 135 patients daily in year 2011. This was a 46% decrease in patient arrivals on average on a daily basis to the A&E department at CWMH.



Limitations of the study worthy of mention are the human error that may be involved from point of data entry into PATIS by the respective individuals. Data is logged into the PATIS from the Records/Statistics Unit. Nevertheless all care has been taken to limit such error and must be accounted for in any study.

CONCLUSION

Decentralisation of health care services had a profound effect on A&E Department, CWM hospital as the attendance was almost halved in 2011 compared to 2010. Further studies need to be done to assess the decentralisation effect in relation to patient: doctor ratio, the variability of cases seen, and performance of medical personnel (medical doctors &nurses) and the availability of equipment in A&E. The effect should also be assessed from the sentinel hospitals and health centre perspectives.

ACKNOWLEDGEMENTS

I would like to thank Dr Praneel Krishna, the then Acting Snr Medical Officer, A & E, Ministry of Health Staff, Mrs. La and Mr. Vinod staff of Department & Records/Statistics Unit of the **CWM** Hospital, my siblings Sisters Kirti & Priya, Brothers Alok & Anurag, for their support.

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LYMPHATIC FILARISIS IN FIJI: INCIDENCE AND REVIEW OF LITERATURE

ABSTRACT

Filariasis in Fiji has been prevalent for a long time. Efficient vector of disease transmission has been present in the country, making the eradication of the disease a difficult task. Early detection and treatment has prevented many of these cases from late complications, however some of them have developed full blown elephantiasis and other disfiguring terminal stages of the disease. Nationwide mass drug administration (MDA) has been in place for the past many years, and has covered wide population. While annual incidence of filariasis remains low, the aim of complete eradication of the disease from the country is a while away.

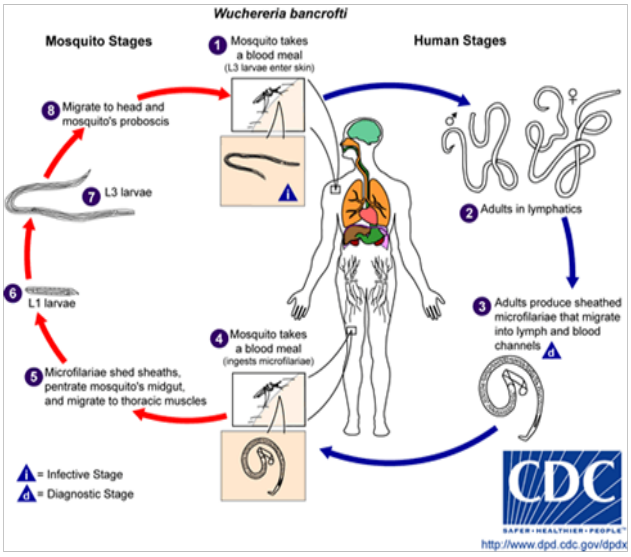
Keywords: Lymphatic Filariasis, Fiji, Pacific, vector

INTRODUCTION

Lymphatic filarisis is a disease of the tropics. The cause of filarisis was discovered in 1877 by Sir Patrick Manson. Lymphatic filarisis is a vector born disease; the vector (usually insects) for filarisis is a mosquito. The three vectors of filarisis are Aedes, Culex and Anopheles. The species causing lymphatic filarisis in Fiji is Aedes fijiensis. The three type of parasitic worms (round and thread like) which lead to this are: Brugia malayi, Brugia timorr and Wuchereria Bancroft (causes lymphatic filarisis in Fiji).

Life Cycle

The parasite is spread from person to person by infected mosquitoes.



Adult worms live in an infected person's lymph vessels, females release large numbers of very small worm larvae, which circulate in an infected blood stream. When bitten by a mosquito (containing larvae) the larvae pass through the skin travelling to the lymph vessels and develop into adults which live for about 7 years.

Lymphatic filarisis which is mostly common known as elephantiasis is characterized by the thickening of skin and underlying tissues.

Lymphoedema also known as lymphatic destruction is a condition of lowered fluid retention and tissue swelling caused by a compromised lymphatic system.

Hydrocele is the development of a pathological accumulation of serous fluid in a body cavity.

Incidence in Fiji

Available literature from PacELF handbook, WHO publication, information available on the websites of these programs and the article published in the Fiji Medical Journal was used to gather information.

Summary

Prior to Fiji joining the Pacific Program to Eliminate LF in 2001, the baseline immuno-chromatographic card test (ICT) prevalence in 2001 was 15.17%. Since then Fiji has implemented 5 rounds of MDA from 2002 to 2006 and a post MDA survey in 2007 found ICT prevalence rates came down to 9.50%. The results of the 2007 survey are presented below by divisional area.

ICT is an established method of diagnosis given the difficulty in diagnosing the filarial worm through thin film of the peripheral blood.

Results of 2007 Prevalence Survey by Division

Division	Number of People Tested	Number of people ICT Positive	ICT Prevalence	Number of People Mf Positive	Mf Prevalence
Eastern	3520	392	11.14%	77	2.19%
Northern	932	27	2.90%	3	0.32%
Western	882	8	0.94%	0	0.00%
Central	1428	220	15.41%	15	1.05%
Total	6771	647	9.50%	95	1.40%

A sixth round of MDA was implemented in 2008 with the goal of achieving 80% coverage using directly observed treatment across each of the four subdivisions. The overall coverage for the country was 56.8, with the Eastern Division having the highest coverage of 84.4%.

INCIDENCE & DISCUSSION

Morbidity data in the central and western division of Fiji islands relating to age group, up to June 2009:

	Age Group			
	1 – 15	16 – 45	46 – 59	60 +
Elephantiasis	0	0	3	12
Lymphoedema	0	2	6	14
Hydrocele	0	13	15	15
Total	0	15	24	41

Elephantiasis and lymphoedema mostly occurs amongst people more than 60 years of age whereas hydrocele affects people of more than 45 years of age.

This is due to:

- Impaired or weak immune system
- Poor environment conditions such as stagnant water in the drain, poor disposal of waste.
- Not taking precautions e.g. not using mosquito repellents, spray, mosquito nets, not wearing appropriate clothes while working outside the house or in a farm.
- Compromised lymphatic system-lymphoedema
- Not taking anti-filariasis tablets due to negligence about the consequences, also due to the associated side effects nausea and drowsiness, vomiting and the amount of tablets.

Data of morbidity cases in the central and western division of Fiji islands relating to ethnicity, up to June 2009:

	Fijian	Indian	Others
Elephantiasis	11	4	0
Lymphoedema	14	6	2
Hydrocele	37	5	1
Total	62	15	3

The highest occurrence of the above case as shown is among the Fijian race, this is due to several factors including:

Location: more of the Fijian population are distributed densely in rural areas that are village setting, highlands, close to forest and natural water supply. These geographical locations are a major contributing factor for mosquitoes breeding places. These locations away from urban facilities also make these people subjected to not obtain the best medicinal facilities available in urban areas.

Job: it becomes a contributing factor for the Fijian race because they are largely employed as farmers, loggers, and fisherman. These increase they exposure time to mosquitoes, making them more prone to these vector-borne disease.

Lifestyle: due to their location and job, their lifestyle is greater affected, that is people are not aware of these types of disease and they first approach is normally traditionally or herbal medicine, which may be appropriate. These also exposure family members and neighbours due to the presence of one infected person, which increase the chance of another. They lifestyle also contributes for them to practices, some improper disposal methods, which increase mosquitoes breeding places.

The reason the above factors do not contribute to high prevalence of these disease in Indian and other races is because the majority of these population does not live in these location specified and are either employed in the jobs listed, though lifestyle maybe the contributing factor who did not get affected.

Data of morbidity cases in the central and western division of Fiji islands relating to gender, up to June 2009:

	Gender	
	Male	Female
Elephantiasis	9	6
Lymphoedema	2	20
Hydrocele	43	0
Total	54	26

Elephantiasis: in comparison males are affected more than females this could be due to the amount of exposure. By this it means that males are more exposed to the vector as compared to females. This applied to the pacific setting males mostly go out to work in the fields and are less likely to wear enough protective clothing (mostly due to humid weather) most of the males stay back open.

Lympheodema: in this it's seen that females are affected more than males with a ratio of 1:10. The primary reason for this could be a hereditary factor. As for males the hereditary factor is passed down the y gene therefore it will not be expressed as the X gene is dominant. In comparison females both have X genes therefore there is a much higher chance for expression of this gene; hence more females are seen with this of filarisis. Also exposure is a factor females usually go out washing, fishing, etc and water is a breeding ground for mosquitoes therefore they are more condensed in these areas.

Hydrocele: this is more prone to affect the male genetalia mainly the scrotum which is not present in females thus no females are seen with this type of filarial. This usually leads to swelling of dysfiguraton of the gentelia.
Strategies for filariasis eradication:

Outreach: should be able to reach rural areas & drugs should be made more accessible to the general public

More resources should be diverted to the mass drug administration program

Mosquito breeding places should be destroyed

People should take heed of advice provided by health professionals in regard to filariasis

People working in areas prone to mosquito infestation should wear protective clothing

Use preventative methods to keep away from mosquitoes, e.g. mosquito repellent, nets, etc.

CONCLUSION

From the research conducted it can be concluded that filariasis was once a major health problem but with the current approach of mass drug administration and child transmission survey we are now reaching appoint where we say there is a high possibility that the prevalence of filariasis can be eradicated [that is under 1%] from Fiji.

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GYNAECOLOGICAL CANCER IN THE NORTHERN DIVISION FROM 2006 TO 2010 - AN AUDIT

Chandra S[1]*

Keywords: Gynaecologcial, Cancer, Divison, Fiji

ABSTRACT

This is a retrospective descriptive study. All the newly confirmed gynaecological cancers over a 5 year interval (2006-2010) in the Northern Division was gathered and analysed. There were 198 cases confirmed. Of these 62% were Fijian females and 37% were Indo-Fijians. Most common was cervical cancer making up to 60% affecting the younger age group. This was followed by uterine cancer, 31% which affected the elder postmenopausal women. Ovarian and vaginal cancer made up 10% together. None of the cancers has shown a decrease in the incidence over the 5 years, thou number of cases for cervical cancer has increased from 2006. Hence general population need to know about these cancers and the risks of getting it. Audit should be done for whole of Fiji and data could be compared between the different divisions.

INTRODUCTION

More women than men are diagnosed with cancer in Fiji; 75 percent of the cases diagnosed are women. In these women, gynaecological cancer accounts for a major percent of the cancers. These are cancers that affect the reproductive system of a woman. The most common types of gynaecologic malignancies are cervical cancer, ovarian cancer, and endometrial (uterus) cancer [3]. There are other less common gynaecological malignancies including cancer of the vagina, cancer of the vulva, gestational trophoblastic tumours, and fallopian tube cancer [3]. Occasionally skin cancers or sarcomas can also be found in the female genitalia.

There are also pre-invasive lesions for cervical cancer classified as carcinoma in-situ, cervical intraepithelial neoplasia, or squamous intraepithelial lesion [5]. For statistical registration purposes, since 1984 the International Classification of Diseases code for carcinoma in situ of the cervix uteri includes CIN3 with or without mention of severe dysplasia.

Pre-cancerous cells can take 10-15 years to develop into cancer so early detection is very important in treating cervical cancer. Fortunately, more than 90% of this type of cancer is curable if the disease is detected and treated early enough [2]. The introduction of the Pap smear test in 1941 has greatly reduced the number of cervical cancer-related deaths. This screening prevents up to 3900 cases of cervical cancer in the UK each year [2].

In Australia in 2006, the most common gynaecological cancers were cancers of the uterus (42% of all female gynaecological cancers), ovary (29%) and cervix (17%) [11]. These statistics, when compared to those from a developing country like Fiji, would differ with incidence of cervical cancer being more than uterine cancer.

For Fiji currently, statistics in the health report indicate that cervical, breast, oesophagus, liver, stomach, ovary, lung, prostate, skin, pancreas, bladder and uterine cancers are the forms of cancer visible in Fiji. Fiji is ranked 15th in the world for ovarian cancer [15].Cervical cancer is the most common form of cancer in females in Fiji and a major cause for mortality in this group; followed by uterine and breast cancer [2].

Apart from cervical cancer there are other gynaecological cancers that are present in females and contribute to mortality. There is not much data available about different gynaecological cancer except for cervical cancer; especially in the northern division not much data is available any of these gynaecological cancers.

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In Fiji the only gynaecological cancer reported most often is cervical and this could be due to the fact that a cancer is named after a place where it is initially found, (and also it is the most common cancer in women in Fiji). Also because majority of the cancer cases are cervical cancer and the fact that it is preventable; health ministry focuses more on the education and preventive measures for cervical cancer. Hence most of the knowledge shared to the public is solely about cervical cancer.

There are other forms of cancer that affect women which they should be aware, like uterine cancer. Uterine cancer is more common in the older, post-menopausal ladies and most of them present late as they are not aware of the signs and symptoms. This common pattern is observed in all developed countries and another pattern in developing countries, fact is that the incidence of different gynaecological cancers is different in the countries worldwide. Hence there is a need for may be all the countries to know there individual pattern of the different gynaecological cancers. This would be best addressed through frequent visits to doctors and doctors having baseline data about these cancers especially with the incidence and distribution among the different races and ages.

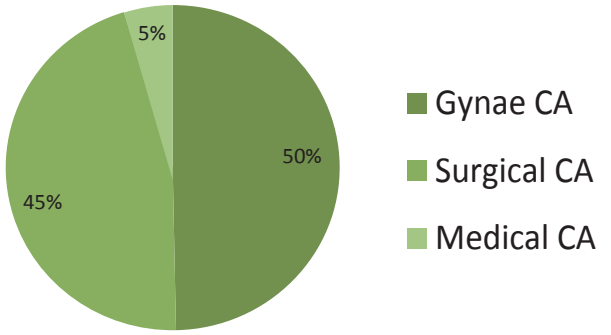
METHODOLOGY

This is a retrospective descriptive analytical study for a five year interval. Time interval was from 2006 to 2010. Data was collected from the histology register of the pathology department of Labasa hospital. From all the specimens collected over the 5 years, those that were positive for malignancy was separated and entered into Microsoft excel. From all these positive cases, all the gynaecological cases were selected and analysed. Demographic features including the race and age of these cases, the different sites from where the specimens were collected from and the histological features were analysed. The incidence of different gynaecological cancers and the trends was also studied.

RESULTS

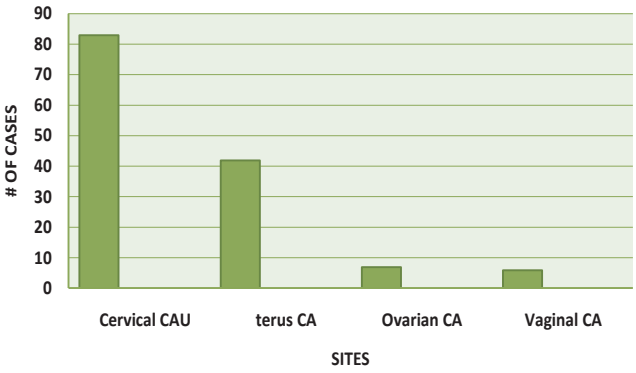
There were a total of 352 new cancer cases diagnosed over the 5 year interval. From this 158 cases were gynaecological cancers.
The following graph shows the distribution of the all the cancers upon different speciality.

Distribution of CA by Department



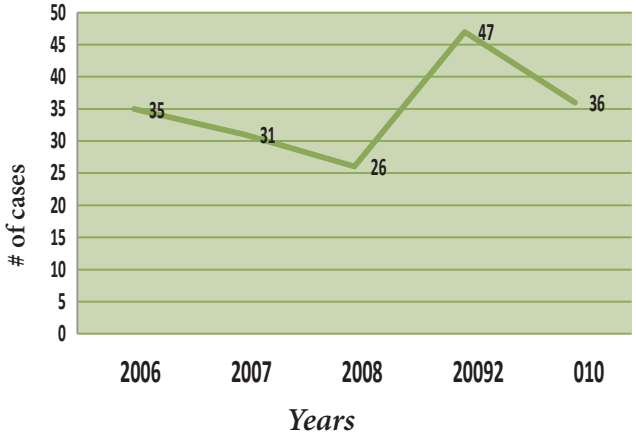
Different types of gynaecological cancer was also analysed and incidence of each is shown in the following graph.

Types of Gynacologial Cancers



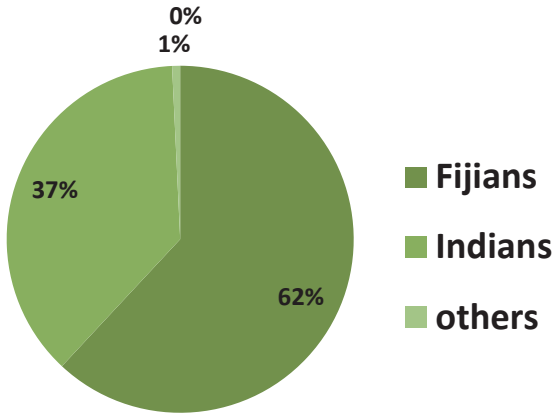
Over the 5yr interval, the trend in the number of gynaecological cases was noted and is as shown below.

Number of Cases over the 5 years



The ethnicity distribution of the cases was analysed and is as shown in the graph below.

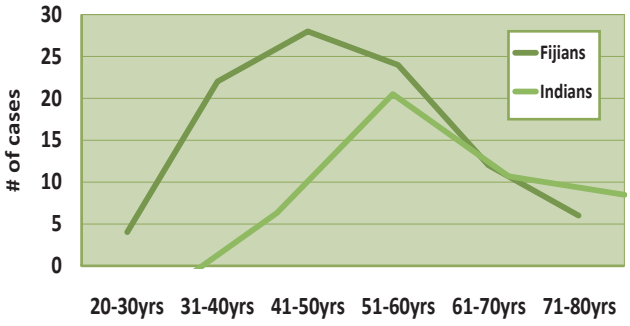
Ehthicity Distribution



The following table summarizes the age distribution of the cancer cases and pattern is demonstrated in the graph below.

Age group	No. of cases	Fijian	Indo-fijian
20 -30yr	54		0
31 -40yrs	32	22	9
41 -50yr	53	28	22
51 -60yrs	40	24	13
61 -70yrs	23	12	11
71 -80yrs	10	6	4
81 -90yrs	1	0	1

Age Distribution of Cases in Different Race



Previous graph shows the age distribution pattern in the two major races.

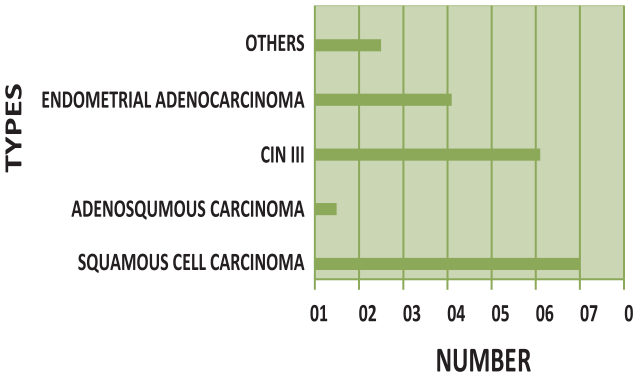
The Following table shows the age distribution in the different types of gynaecological cancer in the two major ethnic groups.

Age group	20-30yr		31-40yrs		41-50yr		51-60yrs		61-70yrs		71-80yrs		81-90yr	
Cervical # of cases	3		19		34		23		4		6		-	
F I	3	0	13	4	22	12	16	7	2	2	5	1		
Uterine	-		9		13		14		18		3		-	
F I			6	3	3	8	7	6	9	9	1	2		
Ovarian	1		3		3		-		-		-		-	
F I	1	-	3	-	2	1								
Vaginal	-		-		2		1		1		-		-	
F I					1	1	1	-	1	-				

F – Fijians I – Indo-Fijians

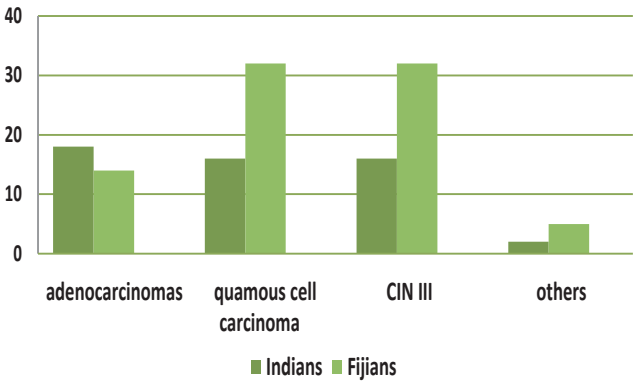
The graph below shows the histological findings of the specimen sent; the type of cancer.

Different Histology for Cancers

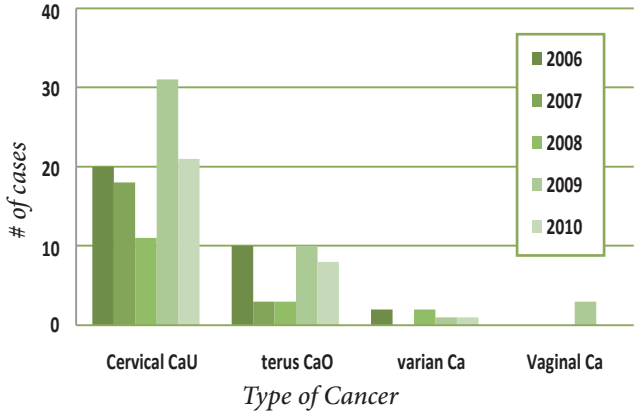


The more common histological finding in the different race was also noted and whether there was any difference in the two groups.

Distribution Of CA in Different Races



The trend over the 5 years for the different gynaecological cancer was analysed. Only for cervical cancer, there was a marked sudden increase in the number of cases in 2009



It was found that cervical cancer was more common in the Fijian population whereas the uterine cancer was more in the Indo-Fijian population.

DISCUSSION

Over the 5 year period there has been a total of 352 positive new cancer cases in the Northern Division out of the entire specimen that was sent over the 5yrs. There was an average of 35 new cases being diagnosed each year in the division. There were 263 female cases and of these, 158 cases were gynaecology cancers. This made up 50 percent of cases over the 5 years and 52% of all female cancers. In contrast, for Australia [7], the 2007 analysis showed that gynaecological cancer accounted for only 9.3% of all female cancers. This is quite less compared to the women in Fiji, thou the figure is just for Northern Division.

The number of cases detected and confirmed over the 5years decreased from 2006 to 2008 and then there was a sudden increase in 2009, and it dropped again in 2010. Some of the factors that can be affecting the number of positive cases is the number of cases screened, the number of patients who had surgery and the availability of the surgeons to perform the surgery, availability of the instruments to do the tests or collect specimen. All of these factors influence the number of specimen send and availability of the pathologist to read the specimen, which is a problem here in the northern division.

The different types of gynaecological cases included the cervical cancers, cancer of the uterus, ovarian cancer and vaginal cancer. The most common cancer was cervical cancer including CIN III, followed by uterus, then ovarian, then vaginal. In developed countries like Australia, data from 2006 showed that most common cancer was uterine cancer followed by ovarian and then cervical cancer [7]. It is stated that cervical cancer is cancer of developing countries whereas uterine cancer is more common in developed countries. The two major races in Fiji, Fijians and Indo-Fijians accounted for most of the cases with few from other race. With regards to the racial distribution, 62 percent of the cases were Fijian and 37 percent of the cases were Indians with others making 1 percent of the total cases. This particular pattern could be due to the population size of the two races. In 2007, Fiji population was made up of 57% of Fijians, 38% Indo-Fijians and 5% others [16]. Thou the number of Fijians diagnosed per year have been increasing whereas for the Indo-Fijians the number has been around the same level.

It could mean either less screening in the Fijian population or there has been lack of knowledge in these women regarding the preventive measures; especially for the cervical cancers. Study [9] conducted in Fiji, in the central eastern division showed that there was poor knowledge about cervical cancer in the women and majority of them had Pap-smear done only once.

Age of the affected women ranged from the youngest being 28yrs and oldest being 85yrs of age. Most of the cases were from the age group 30 to 50yrs and the highest numbers coming from the age group of 40-50yrs; similar distribution pattern was seen in both the races. For cervical cancer most of the cases were between the ages 30 years to 60 years. This age range was same for the two ethnic groups. As for uterine cancer, most of the cases were from 40years of age to 70 years. For the Indo-Fijians, majority of them were elder women; as for Fijian women, quite a number of them were diagnosed in the thirties. About one

third of these women had metastasis from the primary site of cervical cancer.

Histology findings of all these positive cases included squamous cell carcinoma; adenosqamous cell carcinoma, cervical intraepithelial neoplasm III (CIN III), adenocarcinoma and others. Others included leiomyosarcoma and mullerian tumour. Most of the specimens turned out to be squamous cell carcinoma followed by CIN III and then adenocarcinoma. These were mostly the cervical cancers which had squamous cell carcinoma. Uterine cancers were more of adenocarcinomas.

Cervical cancer accounted for more than half (60%) of the gynaecological cancer. As shown previously as well, cervical cancer accounts for majority of the gynaecological cancer in Fiji and hence this could be the reason why more emphasis is put on this type of cancer than the other types. Occurrence was common in both the Indo-Fijian and the Fijian population but when considering the proportion with regards to other cancers within each group, the incidence of cervical cancer was more in the Fijian females. Study [13] done in the 1970s also stated that their present data did not support earlier suggestions that Fijian women are less often affected than Indian women.

The number of pap smear done annually was also analysed. There was a direct relationship in the number of pap smear done and the number of positive cases detected. These were mostly the CIN III cases. This is good in a way that there will be early detection of the disease, hence early intervention and better prognosis in most of the cases. Some of the uterine cancers are secondary to the spread of cancer from the cervix, which is the primary site. The availability of the equipment and the increase knowledge in the general public would mean an increase in the number of pap smear done and thus more chances of early detection of the cases.

There were a total of 42 uterine cancers diagnosed over the 5yrs with more of the Indo-Fijian females being affected. This could be cause of genetic disposition in the Indian population. Another reason could be the early presentation by the Indo-Fijian females, even after 1 episode of postmenopausal bleeding. There were about 72% of the cases who fell between the ages 50-70yrs and few of them were diagnosed in the early ages. Histological finding was mostly adenocarcinoma followed by adeno-squamous carcinoma and then squamous cell carcinoma.

There were only 7 news cases of ovarian cancer diagnosed over 5 year intervals in the northern division; with 1 or 2 cases per year. All the female were Fijian ladies aged between 30-50yrs of age. Most of the cases were adenocarcinoma with 2 surface epithelial tumour. For vaginal cancer, there were 6 cases. Out of this, 5 were Fijians and 1 was Indo-Fijian and all of them were 49yrs and above. Most of these cancers are secondary to metastasis from the primary cervical cancer. Thus could be the reason for it to be common in the older aged women.

CONCLUSION

Gynaecological cancer remains to be of concern with it making half of all the female cancers, here in the Northern division. As shown in this study cervical cancer continues to the leading gynaecological cancer affecting the younger group as compared with the other cancers. Pap smear continues to the major screening tool, thou there has not been any significant increase in the number of cases screened over the five years, especially here in the Labasa Hospital. The trend over the five years has shown that the number of cases detected has increased over the years.

Other cancers are also important like uterine cancer which affects a quite number of people as well, thou there has not been any increase in the number of cases over the five years. For ovarian cancer and vaginal cancer the incidence here in the northern division has been quite less with only few cases diagnosed over the five years. But for ovarian cancer, thou the incidence is low, general public should have a fair amount of knowledge regarding it as the mortality rate is high.
More the Fijian females were affected than Indo-Fijian female. Incidence of cervical cancer was

seen more in the Fijian females, whereas uterine cancer was more common in the Indo-Fijian females. Risk factors could be the main reason for the difference between the two groups, especially with regards to HPV infection and genetic predisposition.

Having a high index of suspicion in women who present with post menopausal bleeding will improve our case identification for endometrial cancers and ovarian cancers because there is no reliable screening method, and patients will continue to present late with overall disappointing treatment outcome.

This study only focused on the demographic patterns, incidence and trend of the different gynaecological cancer, it would be interesting to find out further information on each case. Risk factors in each case, whether they went on for chemotherapy and the mortality rate, are some of the things that can be further researched about.

Over all gynaecological cancers are very often diagnosed here in the Northern division and affects a significant number of the population. Hence more effective measures need to be taken to intervene in the early stages of in the preventive programs. Though majority of the focus should be on cervical cancer, campaigns should always in-cooperate other types as well. Ensuring that all women in the reproductive age group regularly have PAP Smears will certainly reduce the incidence of advanced stage cervical cancer, and ensure that early curable cases are picked up. Having a National screening programme with data base for all women can also ensure that we keep tract on all women that need to be screened.

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FIJI INTRODUCES ROTAVIRUS, PNEUMOCOCCAL & HPV: NEW CHILDHOOD VACCINATION PROGRAMME UPDATE

The Ministry of Health plans to protect more than 22,000 babies from potential killer viruses in a Ministry of Health campaign which will begin across the country on September 17.

Health Ministry spokesperson, Dr Frances Bingwor, said the launch of the 2012 Child Health Week next week in Navua will highlight programs that promote the health of all Fijian babies and children.

Whilst there will be information on the range of programs and activities that promote child health, a major focus will be on the introduction of the two childhood vaccines, namely pneumococcal and rotavirus vaccines.

Pneumococcal diseases are the most common causes of meningitis and bacterial pneumonia in children in Fiji whilst rotavirus is the most common cause of gastroenteritis in children under five, often leading to severe dehydration if not treated adequately.

Dr Bingwor said pneumococcal immunisation would be implemented through the injection of doses of the vaccine at maternal child health care clinics around the country at 6, 10and 14 weeks. The rotavirus vaccine would be in the form of oral drops at 6 and 14 weeks.

Jointly funded by the Ministry of Health and AusAID, the immunisation will see infants born from September 17 2012 protected from pneumococcal and rotavirus infections. To commemorate this date the Child Health Week will launch the new Fiji Child Health Record which is a pocket-sized waterproof document to record the wellbeing of children from birth to primary school age for children.

Successful implementation of child health programs will see Fiji closer to achieving the Millennium Development Goal 4 which is to reduce child mortality rates by two thirds.

HUMAN GENETICS AND HEALTH IN FIJI

BACKGROUND

In the eleven years since the publication of the first draft of the human genome project, researchers from around the world have dramatically improved our understanding of the genetic basis of a wide range of complex mostly chronic diseases. So far, however, the majority of this research has been conducted in people of European descent while the greater burden of human disease exists outside these populations. Attempts to address this discrepancy are in progress, including the efforts to pursue a large-scale genomics research programme in Africa, but Pacific Island Nations have to date been almost entirely left out.

A workshop on this important research area is currently being organized collaboratively by the following organisations; Fiji National University, University of Oxford, University of Melbourne and Ministry of Health, Fiji. The workshop which will be held on the 6th of November at the Fiji National University's Hoodless House, aims to stimulate interest in human genetics research in Fiji and explore its potential to bring benefit to human health not just in the Pacific but also around the world.

The main objectives of the workshop are;

1. To provide an introduction to human genetics research and explore its potential to Bring benefit to human health in Fiji

2. To explore the secondary more immediate health benefits of realizing large scale basic science research projects in Fiji

3. To outline the rationale for adding Fijian genomes to the growing number of human genomes available to the scientific community through freely accessible public databases.

The confirmed learning sessions include;

- Development of an immunogenetics laboratory at Fiji National University
- Studying genetic susceptibility to group A streptococcal disease in Fiji
- Integrating basic science and disease control for group A streptococcal disease in Fiji
- Addressing challenges: investigating genetics of RHD in Aboriginal Australians
- Publically available Fijian genomes to stimulate genetics research in the Pacific
- Facilitating research: Fiji Ministry of Health's research ethics systems

To book a place please contact Santha.Muller@fnu.ac.fjor tomparks@well.ox.ac.uk.

EMBEDDING EVIDENCE-INFORMED DECISION-MAKING INTO POLICIES THAT BENEFIT HEALTH

Mavoa H[1], Snowdon W[1,2], Waqa G[2]*

Keywords: Evidence-Informed Decision-Making, Policies, Health

BACKGROUND

It is well recognised that evidence-informed decision-making (EIDM) provides the basis for sound policies that stand the test of time. Evidence-informed decision-making refers to the use of evidence to inform the decisions [1, 2] of policymakers, researchers and practitioners. Policy-makers who use EIDM effectively access the best available evidence, critically analyse that evidence and then integrate or adapt it to inform policy-making decisions. However, there are three other key elements that predict the use of evidence to inform policy.

First, the onus is on academic researchers to ensure that evidence is both relevant and readily accessible. Relevance refers to fit between the research and organisational needs. In terms of policy, research that is considered to be part of a wider policy agenda is more likely to be used.[3] Relevance can be enhanced by researchers and end-users working collaboratively to: i) develop research agendas,[4] and ii) coordinate timing of outputs that are key to policy development timelines.[4] Accessibility of research findings is determined by a number of factors, including the presentation of results: i) in a timely manner (as soon as possible after research completion), ii) in a forum that can be readily accessed (e.g. open access journals), and iii) in a way that is easily understood (e.g. reducing research jargon and using the language of policy-makers).

Second, research is more likely to be utilised and applied if there is an organisational culture that supports evidence-informed decision-making.[5] Organisations that support EIDM have structures and processes in place to not only to support skill development, but also to: i) provide resources for personnel to use these skills to inform a policy, and ii) recognise and reward these activities. Many organisations initiate and/or support staff to attend workshops to develop their EIDM skills. Infrastructure support is seen as an important precursor for the incorporation of evidence into decision making. [6, 7] Incorporation or embedding of EIDM skills requires the establishment on structures and processes to support EIDM. It also requires the active promotion of an organisational culture that values the use of best available evidence in policy-making.[7] This valuing of EIDM includes recognition and rewarding of evidence-informed decision-making in policy development. One way of creating an organisational culture that sees EIDM as fundamental to policy development would be to specify EIDM skills in position descriptions and performance indicators. Other strategies to integrate EIDM into organisational culture include the provision of resources for accessing and utilising evidence. Resources include: i) allowing reasonable time for accessing and utilising evidence, for example longer lead-in periods for the development of policies, ii) providing facilities that allow ready access to relevant evidence, for example internet access, iii) providing technical support to enhance EIDM skills and/or complete part of the process, for example, undertake a critical review of the evidence, and iv) build a critical mass of staff members who can support the use of EIDM in policy development.[8]

The third element that determines the use of EIDM to inform policy is the quality of links between researchers and users.[9] The use of knowledge exchange processes to build this researcher-policy-maker relationship will be the subject of a future paper.

In sum, EIDM in the development of policy in

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an organisation requires a critical mass of people who have the skills to acquire, assess and adapt evidence to inform policy, the availability of timely, relevant evidence in language that resonates for policy-makers, an organisational culture where there are clear structures and processes in place to support EIDM, and that recognises and rewards the use of EIDM, and strong researcher-end-user relationships.

The organisations involved in the TROPIC project in Fiji (see Waqa et al. this volume), including the Ministry of Health, are now well-placed to build on: i) excellent relationships with researchers, and ii) the growing number of personnel who have acquired EIDM skills through the TROPIC project. The next challenge is to continue to develop a culture where there is a solid organisational infrastructure to support evidence-informed decision-making that informs all policies that have potential health benefits.

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DIABETIC FOOT SEPSIS IN FIJI: INCIDENCE AND REVIEW OF LITERATURE

Sharma V [1]

ABSTRACT

Maturity onset Diabetes is affecting Fiji and Pacific in epidemic proportions. Current information indicates the incidence of diabetes mellitus over the age of 40 years to be between 30 and 50 percent of the total population. Indigenous Fijians are at higher risk of developing diabetes, particularly those who are overweight and with sedentary lifestyle, although no race with similar risk factors are immune to developing diabetes. A high numbers of those who develop diabetes fail to successfully manage their sugar level, and eventually end up developing various complications, such as diabetes foot sepsis and amputations, diabetic keto-acidosis, and end stage kidney disease, Hospital data indicate the rate of diabetes related amputations to be around 300 every year. Management of Diabetes and its complications are responsible for taking up major share of health ministry's resources.

Keywords: Diabetes, Foot sepsis, amputation.h

INTRODUCTION

Diabetes Mellitus and its complications have grown to become one of the major health problems in Fiji. A diabetic is at risk from complications of neuropathy, peripheral vascular diseases and impaired wound healing. These health complications cause circulation impairment, diminished skin sensation and poor wound healing, resulting in infection, ulceration, gangrene and consequently amputation.

The purpose of this paper is to reflect upon the patterns associated with diabetic foot sepsis.

MATERIALS AND METHOD

Data on diabetes and its complications leading to foot sepsis was obtained from the Statistics Unit, Ministry of Health based on various parameters. Available data from years 2001 and 2009 was analyzed.

RESULTS

Ethnic Distribution

Ethnic Distribution of Patient with Foot Sepsis

	2001		2009	
ETHNIC GROUP	TYPE 1	TYPE 2	NIDDM	UNSPECIFIED
FIJIAN	2	9	8	39
INDIAN	1	7	11	7
OTHERS	0	2	0	3
TOTAL	3	18	19	49

In 2001 Type 1 and Type 2 diabetics were reported with foot sepsis. 67% of Type 1 diabetics were Fijian and 38% were Indian. While half the cases for Type 2 diabetics with foot sepsis were found to be Fijian, 39% Indians and 11% from other ethnic groups.

Age Distribution

Age of Diabetics with foot Sepsis

	2001		2009	
ETHNIC GROUP	TYPE 1	TYPE 2	NIDDM	UNSPECIFIED
<9	-	1	-	-
20 -24	-	-	-	2
25 -29	-	-	1	-
30 -34	-	-	1	2
35 -39	-	-	-	-
40 -44	-	-	1	1
45 -49	-	3	5	10
50 -54	1	4	2	9
55 -59	-	2	5	9
60 -64	1	5	-	2
65 -69	1	2	2	7
70+	-	1	2	7
TOTAL	3	18	19	49

In 2001 patients with Type 1 diabetes foot sepsis mostly found over the age of 50 while those

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with Type 2 diabetes associated with foot sepsis were mostly found over the age of 45. With the exception of just one case which was reported in a child less than 9 years of age.

In 2009 NIDDM patients with foot sepsis was commonly seen in patients over the age of 40 with the exception of 2 cases between the ages of 25-34. However, among those patients with unspecified diabetes 4 cases were seen during the age of 20-34 while a magnitude of cases was noted in patients over the age of 40.

Gender Distribution

Gender Distribution of Diabetics with Foot Sepsis

	2001		2009	
ETHNIC GROUP	TYPE 1	TYPE 2	NIDDM	UNSPECIFIED
MALE	29		52	2
FEMALE	19		14	27

In 2001, patients reported with foot sepsis in Type 1 diabetics, 67% were males and 33% were females. The males and female were equal (50% each) for type 2 diabetics.

In 2009, there were 26% males reported with foot sepsis and 74% were females. These patients were NIDDM. Among those patients with unspecified diabetes 45% were males and 55 % were females.

DISCUSSION

Diabetic foot sepsis is developed through numerous factors which include neuropathy, peripheral vascular disease and hyperglycemia. In sensory neuropathy there is diminished perception of pain and temperature, so delays in injury presentation are common. Autonomic neuropathy can cause diminished sweat secretion resulting in dry, cracked skin facilitating microorganism entry, while motor neuropathy can lead to foot deformities. Due to peripheral artery disease there is impaired blood supply which is needed for healing of infections. Hyperglycemia weakens neutrophil function and reduces host defenses. Another cause leading to foot sepsis is trauma which slows the healing of wounds leading to secondary infections.

Management of diabetic foot infections requires attentive wound management (which is relief of pressure on the ulcer, wound cleansing and debridement of callus and necrotic tissue), good nutrition, antimicrobial therapy, glycemic control, and fluid and electrolyte balance.

Conclusion

Diabetes sepsis is prevalent among the two major ethnic groups in Fiji, the Indians and the Fijians. It is common in those over the age of 45 and mostly amongst the females in Fiji. Diabetes sepsis is perhaps a growing problem due to the lack of awareness among the people and maybe even due to the sheer ignorance of some.

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THE INCIDENCE OF TYPHOID FEVER IN FIJI FROM 1995 - 2009.

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ABSTRACT

Typhoid fever is a worldwide burden in undeveloped countries where poor sanitation and hygiene are prevalent. It is a bacterial disease caused by the gram negative facultative rod-shaped bacteria, Salmonella Typhi. The mode of transmission is via the feco-oral route through contaminated water, food, and objects. In Fiji since 1995, annual typhoid cases were almost constant and did not seem to endanger the lives of the people. However from 2004, numbers of typhoid outbreaks have affected all the divisions. The incidence of typhoid fever has been found to be highest in the Northern division with the most affected age group being 10-19 years of age. Fiji as a developing country with areas of high population density such as 'slums' or squatter settlements' that enhances the transmission of the disease through poor sanitation, contaminated water supplies, kava drinking, and public not adhering to health awareness and education. The epidemic can be curbed only with public initiative in conjunction with the Ministry of Health since the health sector can do very little in its attempts to control Typhoid Fever without the support of the general public.

Keywords: Typhoid fever, salmonella, incidence, division, Fiji.

INTRODUCTION

Typhoid fever is a multisystemic disease caused by Salmonella Typhi and Salmonella Paratyphi which produces a milder form of the disease. (1) Salmonella are gram negative facultative rod-shaped bacteria that belong to the family Enterobacteriaceae or enteric bacteria. Their habitat is mostly the intestinal tract of humans and animals while for S. Typhi, it is only humans. (2, 3)

In least developed and developing countries the incidence of typhoid fever is a major problem. The year 2000 saw a global estimate of 21,650,974 typhoid cases out of the 6,091,349,000 global population. The highest number of cases was reported in Asia with a crude incidence rate of 274 per 100,000 persons per year. For the Oceania region, the crude incidence rate was found to be 15 per 100,000 persons per year, while the lowest incidence's recorded were for Europe and Northern America with 3 and 1 per 100,000 persons per year respectively. (4) These findings can be linked to the fact that improvement in water treatment, sanitation and infrastructure is a key component for the low incidence rates in industrialized countries while the opposite may be true for regions of high incidence rates. (5)

Salmonella Typhi is transmitted to a person via the feco-oral route by ingestion of food and fluid contaminated by excreta from patients, chronic carriers or unhygienic practices in food and water handling. Unhygienic practices in the past have been a recorded cause of outbreaks. In a restaurant in San Antonio Texas, in the year 1981, employees handling food with their bare hands led to contamination of the food resulting in an outbreak. All affected customers had eaten a particular dish in common. (6) Another such incident occurred in Maryland in the year 1986. The culprit was a shrimp dish prepared in a restaurant. (7) In the Pacific region, the republic of Nauru had a similar incident where in a restaurant, food had been contaminated by two S. Typhi carriers. (8)

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Pathophysiology and complications

S. Typhi is transmitted via the feco-oral route through contaminated food and water. The ingested S. Typhi is engulfed by phagocytic cells which then pass them through the mucosa and present it to macrophages. S. Typhi has specialized fimbriae that adhere to the epithelium over clusters of lymphoid tissue in the ilium (Peyer's patches) which serves as the main relay point for macrophages travelling from the gut to the lymphatic system. They then induce macrophage apoptosis and finally breaking out into bloodstream to invade the rest of the body. This takes up to 2-3 weeks hence signs and symptoms appear at a later stage prior to infection. The signs and symptoms of typhoid fever includes poor appetite, headaches, generalized aches and pains, fever usually 39-40°C, lethargy and diarrhea mostly in children and constipation in adults. Complications include bowel perforations and massive hemorrhages together with gall bladder diseases. (1, 7, 8)

LABORATORY DIAGNOSIS

In the Department of Clinical Pathology Services of Fiji's largest divisional healthcare facility at the Colonial War Memorial Hospital, the lab follow a set Standard Operating Procedure (SOP) for the identification of Salmonella Typhi in blood cultures of suspected cases. The complexity with Salmonella Typhi is that instead of being destroyed by phagocytic cells, it multiplies within them and is disseminated into multiple organs, especially the spleen and liver. Eventually, the phagocytic cells lyse and release Salmonella Typhi into the bloodstream. The time required for this explains why the incubation period of typhoid fever (2 or 3 weeks) is much longer than for salmonellosis (12 to 36 hours). (7)

The culture media used in the lab are blood culture bottle, McConkey agar (MC), Triple Sugar Iron (TSI) and Lysine Indole Motility (LIM). A three day procedure is followed for the culture examination and identification of organism.

Day 1:
The positive blood culture sample is identified and a direct smear is done, which is then Gram stained and examined. If the smear shows Gram Negative Bacilli then a direct sensitivity test done and sample is cultured on Blood Agar, Chocolate agar and McConkey agar.

Day 2:
The sensitivity is read and recorded as 'Preliminary Sensitivity'. MC plate is examined for Non-Lactose Fermenter (NLF). Any NLF growing is typed with Salmonella antisera (Difco® Bectan Dickinson). If there is a positive typing result then the ward and infection control nurse are informed and the result is portrayed as 'Salmonella Typhi isolated but not yet confirmed'. The test colony is then inoculated into TSI/LIM. A "Microbact" (a Gram Negative identification system) and sensitivity test is also done.

Day 3:
The "Microbact" and TSI/LIM tubes are examined for reactions of S. Typhi. The organism is a glucose fermenter hence produce half pink (media colour) and half yellow colony with black spots due to the production of hydrogen sulphide. "Microbact" and TSI/LIM positive reactions give the 'confirmatory identification'. Sensitivity is read and recorded as 'confirmed sensitivity'. (9)

Treatment

Typhoid fever is treated with antibiotics that kill the Salmonella typhi bacteria. The oral drug option for treatment is either ciprofloxacin, amoxicillin, cotrimoxazole or chloramphenicol and bactrim. However these drugs are becoming resistant to S. typhi. It begins from the findings in 1950, when the chloramphenicol resistant strains of Salmonella enteric appeared after the introduction of chloramphenicol in 1948. (15) The strain emerged and became multi-resistant against the first line drugs. The drugs that are available and effective against S. typhi are fluoroquinolones, example ciprofloxacin and the third generation cephalosporins, example ceftriaxone.10% - 20% of untreated typhoid fever patients die, but prompt antibiotic treatment can lower this to less than 1%. Ciprofloxacin is the recommended drug for the treatment of typhoid

fever in Fiji. The Fiji Ministry of health made ciprofloxacin the drug of choice for typhoid fever patients of all ages. It is given twice a day for 5 days or until the patient is free of symptoms for 24 hours, whichever is longer. (10) The advantage with ciprofloxacin is that it kills the bacteria rather than just inhibiting its growth as in the case of chloramphenicol.

Dosing for ciprofloxacin

Dosing of ciprofloxacin	Dose	Days
Children under 12 yrs	2	8
Children 2 to 7 yrs*	2	8
Children 8 to 11 yrs*	1	11
Adults and children 12 years and older*	0	0

*maximum dose 20mg/kg

Other drugs that are mentioned above apart from ciprofloxacin are alternative drugs. They are less effective than ciprofloxacin and they must be given for at least 2 weeks. (10)

According to Fiji national typhoid fever treatment guideline (June 2010) All suspected cases should get antibiotics and they must complete the entire course even if the laboratory tests are negative. (10)

The aforementioned statement can be justified by the fact that carrier states of Typhoid also exist. In this the person does not show the symptoms of the disease but sheds the bacteria in the stool or urine. Therefore in the lab, stool samples at 3, 6 and 12 months are examined to determine if the patient is in a carrier state.

Vaccines are also available as oral and IV preparations. Oral preparations of this vaccine include Vivotif oral and IV preparations include Typherix and TyphimVi.

Supportive therapy

Other treatment steps aimed at managing symptoms include, drinking fluids which help prevent dehydration that results from prolonged fever and diarrhea. For severely dehydrated patients an IV infusion is given. Also eating a balanced healthy diet will help replace the nutrients' you lose when you are sick.

Prevention

Preventive measures for this disease includes thoroughly washing of the hands after using the toilet, boil water collected from rivers, creeks or wells or filter them through a clean cloth and treat with chlorine. Also when preparing kava use safe water and wash hands with soap before handling it. Start immunization programs for typhoid fever.

MATERIALS AND METHOD

A descriptive study on Typhoid Fever was conducted using available data from the Ministry of Health. The data was analyzed by gender, age, race, and division.

RESULTS

There were 1509 typhoid cases and eight deaths associated with Typhoid fever in Fiji from 1995 to 2009. Out of the eight deaths, six deaths were in 2009, one in 2008 and one in 1996. Fijians were more affected by typhoid fever (82.5%) than other ethnic groups (*Table1* and *Figure2*). Men were (53%) more affected than women (41%) (*Table1*). The 10-19 age group was the most affected age group (22.9%) (*Table1*). Division wise, the Northern division had the most number of cases (66.4%) as compared to any other division (*Table1* and *Figure4*). Within this division, the Macuata area had the highest number of cases (44%) (*Table1*). Of all the areas in Fiji, Macuata from the Northern division had the highest number of cases (57%). Followed by this is the Suva Urban from the Central division (22%). Ra from the western division accounts for 20% of all the cases. Finally, Ovalau accounts for 1% of all the people who were affected by typhoid from 1995 to 2009.

Figure1: Trend of Typhoid in Fiji, 1995-2009

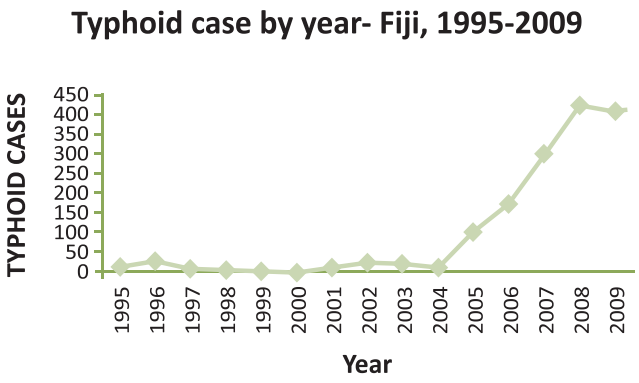


Table 1: Demographic information of Typhoid cases in Fiji, 1995-2009

Variable	Number (%)
Total	1509
SEX:	
Male	799(53)
Female	613(41)
Unknown	97(0.06)
AGE GROUP:	
0-9	259(17.2)
10-19	346(22.9)
20-29	237(15.7)
30-39	188(12.5)
40-49	141(9.3)
50-59	71(4.7)
60-69	27(1.8)
70+	24(1.6)
unknown	216(14.3)
RACE:	
Fijian	1245(82.5)
Indian	136(9.0)
Other	37(2.5)
Unknown	91(6.0)
DIVISION:	
Northern	1002(66)
Western	258(17)
Central	241(16)
Eastern	8(1)
SUB-DIVISION(Northern):	
Macuata	441(44.1)
Bua	236(23.6)
Cakaudrove	227(9.5)
Taveuni	95(9.5)

Figure2: Distribution Typhoid cases by different ethnic group

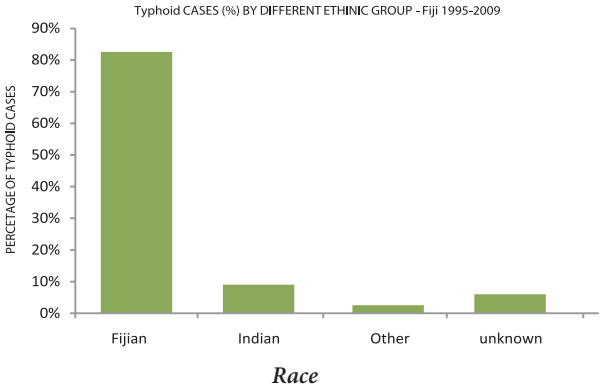
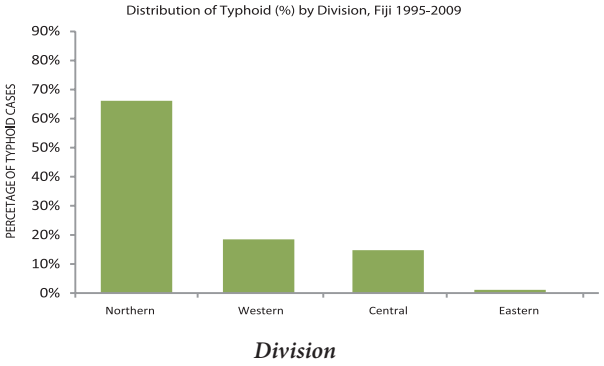


Figure 3: Distribution of Typhoid cases by Division



DISCUSSION

Typhoid fever is not just a problem in Fiji, but it had grown to become a global epidemic. According to a bulletin released by the World Health Organisation in 2004, Typhoid fever affects nearly 16 million people per year worldwide with around 600,000 deaths. (4) The cases have been declining in developed countries while there has been an increase in developing countries like Fiji. This is mainly due to the fact that developed countries have placed stringent measures to monitor the quality of water supplied and also emphasized a lot of hygiene. Since life in the Pacific is more laid back, people tend not to follow the simple suggestions such as boiling drinking water and maintaining good personal hygiene especially after visiting the convenience. Such simple things help a great deal in preventing Typhoid fever. According to WHO South Pacific Communicable Disease Surveillance and Response Team leader Dr. Jacob Kool, Fiji has one of the highest rates of typhoid fever in the world. (11)

The highest number of cases in Fiji has been reported from the Northern division and Suva urban. They mainly have village like settlements where sanitation, water supply, and personal hygiene practice is poor, leading to regular outbreaks. Some of these areas have slum settlements where close contact and sharing is common. Sharing toilets, water supply, and farming tools for example, increases the rate of disease transmission. Recreation socializing such as kava drinking where infected water is used in kava preparation and cups are shared in a big group which is another mode of transmission. Macuata and Cakandrove have the highest number of cases among all areas since 2000. In 2009, the task team set up by the Ministry of Health investigated the prevalence of communicable diseases such as typhoid fever in Northern Division and had identified problems that have led to outbreaks. The causes they found are similar to those mentioned above. (12)

Dwelling into 2010, within the time range of January to August, the number of identified cases has reached 355 compared to 278 cases for the same period in 2009 and there were still more cases coming in from places like Kilikali, Kalekana and Matata settlements around Suva. (13) It is necessary that at this point, public awareness must be enhanced with cooperation from all residents to tackle this serious issue from rising. Today, the reasons leading to rise in typhoid fever cases in some parts of Fiji include:

1. Increase in population density leading to higher rate of transmission of the disease.
2. Poor sanitation e.g. improper waste disposal especially nappies and improper sewer routes that contribute to the spread of the disease.
3. Poor personal hygiene e.g. no practice of boiling drinking water, washing hands with soap after using toilet and before eating.
4. Contamination of water supply e.g. built toilets near wells or rivers which serve as water supply or human feces at river banks where people swim and hang around. One example is the incident that occurred in 2007 where tests confirmed that all water sources in the Natewa Bay and Buca Bay area carry the bacteria Salmonella typhi which causes the disease. (14)
5. People not adhering to the public awareness provided. The public health system is spreading awareness and health education but the residents are ignoring to follow.

Fiji is a tropical country and it experiences its major rainy season between the months of November to April. This period is also called the cyclone season. In March 2010, an outbreak of typhoid fever had occurred following cyclone Thomas. This was mainly due to flooding and contamination of food and water supplies. Hence outbreaks are most common during cyclone seasons and flooding. (3)

CONCLUSION

In Fiji the incidence of typhoid fever has risen drastically from the year 2004. It has been given considerable media attention and people are being made aware of this epidemic. The ministry of health is trying to tackle this rising issue but their efforts seem to be of limited success. Typhoid fever in Fiji has been noted to be more common in the Northern Division. It may be due to contaminated water supply, low sanitation, poor personal hygiene and improper sewage systems. It is found to be more common in Fijians than Indians, perhaps due to rural & remote village settings.

It has been revealed that most of the Typhoid cases in Fiji come from the Northern Division and the year 2008 recorded the highest number of cases being 426. It has also come to light that the main means of transmission is through the feco-oral route via the contamination of food and water. The United Nations Millennium Development Goal 7 is a target set to halve by 2015 the proportion of the population without sustainable access to safe drinking water and basic sanitation. This can prove to be a great initiative in lowering the incidence of typhoid fever. If such a development program can be successfully implemented in Fiji, it will surely be a milestone in curbing the epidemic.

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DENGUE FEVER IN FIJI: INCIDENCE FROM 2003-2009

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Keywords: Dengue Fever, Viral Illness, Arthropod, Fiji

INTRODUCTION

Dengue is an arthropod borne viral illness that is of important significance to the public health sector.(ref) There has not been a good recording system implemented for this disease for the past 20 years that the World Health Organisation estimates that more than 2.5 billion people are at risk of dengue infection. (ref)This is 40% of the world's population and they live in areas where there is increased risk of dengue transmission.

It is not clear when the exact date that the viral illness originated but the first record of probable dengue fever was found in a Chinese encyclopaedia from the Jin Dynasty (265-420 AD) which referred to a "water poison" associated with flying insects. It was only later in the 20th century that the viral etiology and the transmission by mosquitoes were deciphered. An increase in the spread globally was seen during the socioeconomic impact of World War II. It has now spread to over a 100 hundred countries in the Asiapacific, Americas, Africa and the Caribbean.

Signs and symptoms of the disease ranged from influenza like symptoms to a severe sometimes fatal disease characterised by haemorrhage and shock known as dengue hemorrhagic fever or shock syndrome (DHF/DSS). This is caused by the four viral serotypes transmitted from viraemic to susceptible humans mainly by the bites of Aedes aegypti and Aedes albopictus mosquito species. Though one attains lifelong immunity from one serotype, it only confers partial or transient protection against subsequent infection by the other three serotypes.

The burden of disease globally has grown dramatically in recent decades as the graph below highlights. The graph indicates that from the 908 cases in the 1950's, there are over 900,000 cases now in the 21st century.

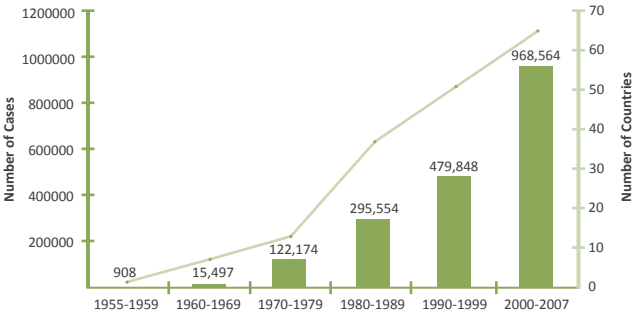

Figure 1. *Average annual number of dengue fever (DF) and dengue hemorrhagic fever (DHF) cases reported to WHO and average annual number of countries reporting dengue (Source: World Health Organization)[1].*

Mode of Transmission

Possible factors for dengue fever spread include:

- Unplanned urban overpopulation of areas leading to inadequate housing and public health systems (water, sewerage and waste management)
- Poor vector control like stagnant pools of water for mosquito breeding
- Climate change and viral evolution (there has been a link to increase virus transmission to El Nino conditions)
- Increased international travel (recreational, business or military) to endemic areas

These factors all contribute to the increase in the number of mosquitoes especially anophelene, aedes and culex genera which are found mostly in the South Pacific. There are 2,700 species of mosquitoes in the world and about 43 of these are found in the South Pacific and 26 of these 43 species are found in Fiji!

Dengue fever is treated symptomatically and is carefully monitored to prevent complications especially dengue hemorrhagic fever. Fiji with

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its beautiful tropical setting is a rich gold mine of mosquito infestations. With more than 300 islands and an estimated population of 850,000, Fiji stands to be the most likely area of an outbreak due to the factors mentioned earlier.

Aim

Using the statistics that were collected and analysed, this paper will review the past dengue outbreaks in 2008-2009 with the laboratory data from Mataika House in 2003-2007. There will also be a brief statistic on the dengue cases in the Solomon Islands.

METHODOLOGY

Data collection:

- This was collected from the Fiji Centre for Communicable Disease Control (FCCDC) at the Mataika House at Tamavua.
- Data was also collected from the "Laboratory Surveillance of Dengue Fever in Fiji – 2003 – 2009: Retrospective Study"
- The internet was also used to help with some of our information gathering
- Data entering and analysis
- With the help of the Microsoft excel programme, the data was tabulated and in some cases represented into a graph to help with identifying trends.

RESULTS

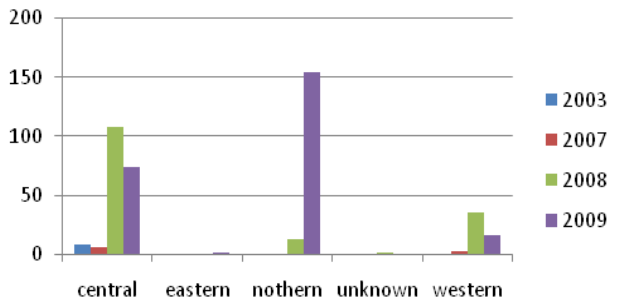
Statistics in Fiji

The table shows the national incidence rate of dengue cases per 100,000 cases.

Division	Population	No. of cases	National rates(x 100,000)
Central	850,700	199	23.4%
Western	850,700	54	6.34%
Northern	850,700	74	8.7%
Eastern	850,700	1	0.12%

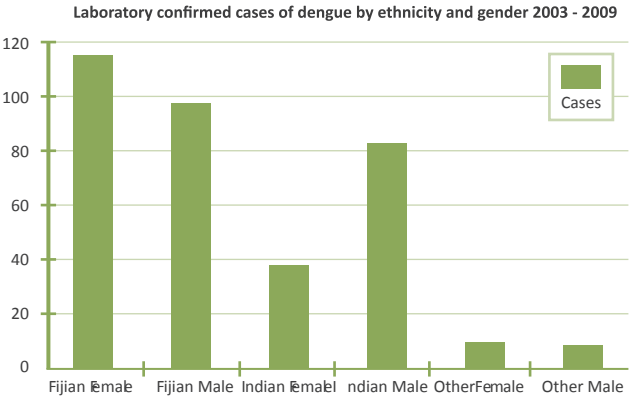
A major dengue fever outbreak occurred in Fiji in 1998 where 24,000 suspected cases, 1,600 hospitalisation and deaths were reported. This was highlighted by the Minister of Health, Dr Neil Sharma as he launched the "Dengue Strategic Plan" for 2010-2014. Two major outbreaks were reported in 2003 and in 2008. The total number of dengue cases from 2003-2008 was 4,451 suspected cases and with 420 positive cases.

Confirmed Dengue (IgM) cases by Divisions in Fiji from 2003-2009



Division	Central				Eastern	Northern		Unknown	Western		
Years	2003	2007	2008	2009	2009	2008	2009	2008	2007	2008	2009
Positive cases	9	6	108	74	1	13	154	1	3	35	16

The graph shows that in 2008, the central division had 108 cases as compared to the 9 cases and 6 cases in 2003 and 2007 respectively. The Northern division also recorded a high number of cases in 2009 with 154 confirmed cases as compared to the 13 recorded in 2008. The Eastern division only recorded 1 case in 2009 whereas the Western division recorded its highest number of cases in 2008 with 35 confirmed cases. From the above data, there were notable years in which there was no proper recording of dengue cases and there was also an unknown confirmed case that had no specific division in the raw data.



In addition, laboratory confirmed cases of dengue by ethnicity and gender from 2003-2009, showed that males were mostly affected when comparing from 2 ethnic backgrounds. Males made up about 54% of the cases amongst Fijians and Indo-Fijians while females made up 45.2%. Males and females showed similar readings amongst other races.

Statistics in the Solomon Islands

Year	Number of suspected cases	IgM Confirmed cases	IgM non-reactive	IgG Confirmed cases	IgG non-reactive	IgG non-reactive
2008	22	21	9	94		2
2009	2		2		2	-
2010	3		3		3	-

The above table shows that in 2008, there were 22 suspected cases in total reported in then hospitals but only 11 were confirmed dengue cases. The two following years shows no confirmed cases though there were 5 suspected cases reported in 2009 – 2010.

DISCUSSION

According to the raw data collected from the National Centre for Scientific and Virology at Mataika House, the analysis presented trends of dengue in Fiji for the past 6 years. The results indicate that there is a certain time during the year that shows peaks in the graphs of positive cases. Most of the cases presented in the 2nd quarter of the year towards the 1st quarter of the following year. This indicates that the dengue fever thrives during cold season of the year and after summer or cyclone season (November - March).

Furthermore, the age distribution of confirmed cases of dengue by gender from 2003-2009 shows that with those aged between 11-40 years (both males and females) old showed vulnerability to the infection in 2008 and 2009. The statistics gathered concluded that Fijian males were the most affected. The ages between 11-40 years were the most vulnerable and most cases were shockingly from urban areas of Suva, Lautoka and Labasa and not from rural areas as one would expect.

With the data collected with regards to the Solomon Islands, we can also gauge the difference in the amount of cases that are presented to the hospitals and health centres. There could be a number of reasons as to why the Solomons have a low number of dengue cases like lack of proper case definitions; poor recording system or maybe their eradication programme is well implemented. For that there will need to have a separate research but as the data available shows Solomons as compared to Fiji have a low number of dengue cases.

CONCLUSION

This paper has enabled us as a group to be able to appreciate the importance of primordial and primary interventions in the public health sector. This has also enlightened our group on the importance and vitality of record keeping in our health sector. Upon the commencement of this project, our group found that there is data available but it was located in different areas and there are not a lot of papers written that brings this data into one location. This was where the difficulty lay but with the help of our group members, we were able to locate some very useful data and information.

The data collected for this write up, enabled us to notice trends with regards to outbreaks and peak incidences in the disease therefore helping the health officials to predict/ forecast future possible outbreaks. As it was there were dengue fever outbreaks in 2003 and 2008-2009 all around Fiji especially in the 3 cities of the main divisions – Suva in the Central Division, Labasa in the Northern Division and Lautoka in the Western Division.

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TUBERCULOSIS in FIJI

*National TB Programme**

Keywords: Tuberculosis, TB-Diabetes Mellitus (DM), Fiji

INTRODUCTION

Tuberculosis (TB) is an infectious disease that is still a major threat to the population of Fiji. The populations most commonly affected by TB are those with low socioeconomic status, poor housing, and unhealthy lifestyles mainly in semi-urban and densely populated areas. In addition to this, other co-morbid conditions such as TB-HIV and TB-Diabetes Mellitus (DM) are challenges which the National TB Programme needs to address to fully control TB in Fiji.

The most recent data from WHO Global Report 2011 shows that Fiji has an incidence rate of 27/100,000 and a prevalence rate of 40/100,000 population. In 2010 there were approximately 191 active TB cases and in 2011 about 213 cases recorded by the national programme. The increase in case detection can be attributed to Advocacy, Communication and Social Mobilization (ACSM) activities, sensitizing medical staff on TB suspect identification, improvement of diagnostic services and other strategic activities supported by the Global Fund. Out of the 213 TB cases in 2011, Central/Eastern division represented 42%, Western 41% and Northern 17%. TB affects mostly the productive age group between 15 and 55 years old who are exposed to various social and environmental determinants. Males represent a higher number of TB cases than females. An estimated 7 to 11% of total TB cases are represented by children under the age of 15 years.

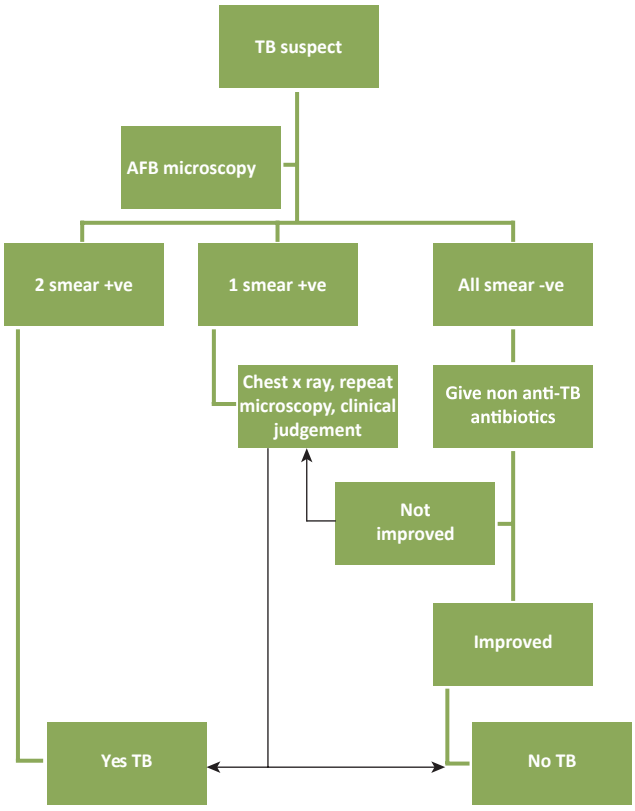
The Treatment Success Rate (TSR) of new smear positive TB cases in 2010 was at a low 67%. Out of the 33% that were not successfully treated, 6% had died, 24% had defaulted and 3 % were transferred out with their outcomes not recorded. The NTP is designing strategies to increase the TSR and especially reduce the number of defaulters through intensive follow up. The NTP continues to apply the Stop TB strategies in controlling TB in Fiji and eliminating it as a public health problem (1<1 million population).

CLINICAL PRESENTATION: SIGNS & SYMPTOMS

Any person with symptoms or signs suggestive of TB should be investigated for tuberculosis.
The most common symptom of pulmonary TB is a productive cough for more than 2 weeks, which may be accompanied by

- other respiratory symptoms including shortness of breath, chest pains, coughing up blood (haemoptysis) and/or
- constitutional symptoms including loss of appetite, weight loss, fever, night sweats, and fatigue.

The diagram below show the steps involved in diagnosing an active TB case.



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Sputum Collection

AFB microscopy of sputum smear is a vital procedure in diagnosing TB and below is the steps to guide in the collection and transportation of sputum samples.

Standard procedures for sputum collection, processing, transport

- Fill in the form "Request for sputum examination" (*Tub 3 - See Appendix 3*). Write the registration number and name of the patient on the form and on the side of the sputum cup.
- Demonstrate to the patient how a good sputum specimen is produced by taking a deep breath and coughing deeply.
- Find an outdoor location, away from others, for the patient to expectorate sputum into the sputum container. For children, the use of nebulizers may help in stimulating the airways in order to obtain a good sputum sample.
- Ask the patient to screw the lid onto the container before returning it you.
- Make sure that the lid on the container is firmly close. Place the container inside a plastic bag. Wash your hands.
- When two specimens have been collected, send both the specimens together with the request form to the laboratory as soon as possible. If it cannot be despatched immediately store in a fridge if one is available or a cool place if there is no fridge.
- The specimen should be sent to the nearest DOTS centre within two days. Otherwise it should be sent to the nearest microscopy centre for fixing and then transfer to the DOTS centre.

Referral

TB suspects can be referred to any of the 3 DOTS Centers (Tamavua, Lautoka Hospital-Tagimoucia Ward and Labasa Hospital) using the Referral Form (*Tub1*).

Contact Tracing

All care providers for patients with Tuberculosis should ensure that persons (especially if symptoms suggestive of TB, children <5years of age, persons with HIV infection, and contacts to MDR/XDR-TB) who are in close contact with patients who have infectious TB are screened and attended to accordingly.

The key objectives of screening are to assess if the contact:

- has undiagnosed TB
- is at high risk of developing TB if infected.
- is at high risk of having been infected by the index case

PRIORITIES IN CONTACT SCREENING	
Higher risk of acquiring TB infection	**Higher risk of developing TB disease**
Close contacts of smear positive PTB	Children <5years of age
People with HIV infection	People with HIV infection
People who are highly exposed to smear +ve PTB	People with other conditions that suppress immunity

TB in HIGH RISK GROUPS

People living with HIV infection who are also infected with TB are at great risk of developing active TB. HIV testing of TB patients is conducted at all 3 *DOTS* Centers.

People with Diabetes Mellitus (DM) are 3 times more likely to get active TB. Type 2 diabetes involving chronic high blood sugar, is associated with altered immune response to TB. This leads to patients with diabetes and TB take longer to respond to anti-TB treatment. Screening for diabetes in TB patients is conducted at all DOTS centers

TREATMENT

NTP now uses Fixed Dose Combination (anti-TB medicines) for intensive and continuation phase of treatment. Regimens are available for adults and children and for new patient and re-treatment cases.

The standard regimen for adults is: 2RHZE/4RH (2 months of Rifampicin, Isoniazid, Pyrazinamide, and Ethambutol; plus 4 months of Rifampicin and Isoniazid). For dosage information, refer to the TB Technical Guidelines.

TREATMENT OUTCOMES

Evaluation of treatment outcome in new pulmonary smear-positive patients is used as a major indicator of programme quality. Outcomes in other patients (retreatment, pulmonary smear-negative, extra¬pulmonary) are analysed in separate cohorts. Each registered patient should have his/her outcome recorded in the register as soon as treatment course is completed. The following treatment outcome definitions should be used for sputum smear-positive patients.

Treatment outcome definitions

OUTCOME	DEFINITION
Cured	A patient whose sputum smear was positive at the beginning of the treatment but who was smear- negative in the last month of treatment and on atleast one previous occasion.
Treatment completed	A patient who completed treatment but who does not have a negative sputum smear result in the last month of treatment and on at least one previous occasion.
Treatment failure	A patient whose sputum smear is positive (and culture positive) at 5 months or later during treatment. Also included in this definition are patients found to harbour a multidrug-resistant (MDR) strain at any point of time during the treatment, whether they are smear-negative or positive.
Died	A patient who dies for any reason during the course of treatment.
Default	A patient whose treatment was interrupted for 2 consecutive months or more.
Transfer out	A patient who has been transferred to another recording and reporting unit and whose treatment outcome is unknown.
Treatment success	A sum of cured and completed treatment.

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3. *TB Technical Guidelines 2011*

GLOSSARY

ACSM	Advocacy, Communication and Social Mobilization
AFB	Acid Fast Basili
A&E -	Accident and Emergency
COD	Certification of Death
CSDs	Climate-Sensitive Dieseases
CWMH	Colonial War Memorial Hospital
DC	Death Certificates
DF	Dengue Fever
DHF	Dengue Hemorrhagic Fever
DM	Diabetes Mellitus
DOTS	Directly Observed Treatment Shortcource
EWS	Early Warning System
EIDM	Evidence-Informed Decision-Making
FNU	Fiji National University
FCCDC	Fiji Center for Communicable Disease Control
GEF	Global Environment Facility
GIS	Geographic Information System
GOPD	General Outpatients Department
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
ICT	Immunochromatographic Card Test
IMCI	Integrated management of Childhood Illness
LIM	Lysine Indole Motility
MC	McConkey agar
MDA	Mass Drug Administration
MDR	Muilt-Drug Resistance
MOH	Ministry of Health
NLF	Non-Lactose Fermenter
NTP	National Tuberculosis Programme
PTB	Pulmonary Tuberculosis
PHIS	Public Health Information Syster
PATIS	Patient Information System
PCCAPHH	Piloting Climate Change Adaption to Protect Human Health
SOP	Standard Operating Procedure
UCOD	Underlying Causes of Death
TB	Tuberculosis
TSR	Treatment Success Rate
UNDP	United Nations Development Programme
WHO	World Health Organization
XDRTB	Multi Drug Resistant Tuberculosis

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