Data for Decision Making

Module 2: Basic epidemiology and data analysis

Kiribati

September 8 – September 13, 2014

Workshop Report

Prepared by: Damian Hoy

1.0 Background to workshop

Climate change poses significant threats to the health of the people of the Pacific. Common climate-sensitive health risks identified across the 14 Pacific Island countries and territories (PICTs) include: vector-borne diseases; food and water safety and security; the potential spread of food- and water-borne diseases; exacerbation of non-communicable diseases; injuries and deaths from extreme weather events; increasing cases of ciguatera; and disorders of mental health. Strengthening capacity for outbreak surveillance and response is a common area identified by PICTs for adaptation to the health threats of climate change. Related to this, at the Pacific Health Ministers' meeting in 2011, one of the key recommendations was *"to address the lack of trained and experienced epidemiologists in the region..... development of comprehensive training programmes to develop core competencies in "data techs", "epi techs" and epidemiologists"*.

In response, the Pacific Public Health Surveillance Network (PPHSN) regional partners (World Health Organization – WHO; Fiji National University – FNU; US Centers for Disease Control and Prevention – CDC; The Pacific Island Health Officers Association – PIHOA; and the Secretariat of the Pacific Community - SPC) have revitalised and redeveloped the existing Pacific data for decision-making (DDM) program. Partners are currently exploring ways to broaden this program to strengthen essential public health functions and services in the PICTs. The DDM is delivered in four modules plus a research project. The four modules are: outbreak surveillance and response; basic epidemiology and data analysis; more advanced epidemiology and data analysis; and public health surveillance. The DDM program is accredited by FNU for a post-graduate certificate in epidemiology (DDM).

Module 2 (basic epidemiology and data analysis) was conducted in Kiribati from September 8 to 13, 2014, as a collaboration between SPC Public Health Division, the European Union-funded Global Climate Change Alliance: Pacific Small Island States Project *"Improving implementation of environmental health surveillance and response to climate sensitive health risks in Kiribati",* the AusAID-funded *Response and Analysis for Pacific Infectious Diseases (RAPID)* project, which is a collaboration between Hunter New England Population Health (HNEPH), University of Newcastle, SPC and WHO; Federated States of Micronesia Health Department, the Tongan Ministry of Health, and the University of Queensland HISHub.

History of DDM in the Pacific

PIHOA/CDC developed a discussion paper on DDM in the Pacific following a request by the PIHOA Directors of Health. This was endorsed in September 2004, in Majuro, Marshall Islands, by PIHOA, CDC, SPC, WHO, and FNU. PIHOA/CDC and SPC then adapted the CDC DDM program to the Pacific, and then facilitated accreditation through FNU. The initiative commenced implementation with funding from USAPIs, the SPC, and the WHO. In 2013, the DDM program was re-invigorated by a group of epidemiologists from SPC, PIHOA, the RAPID project (including Hunter-New England Health District/Univ. of Newcastle), WHO, CDC, and FNU. This involved revising the curriculum and re-developing most of the existing presentations, exercises and resources. DDM1 was adapted and piloted twice in 2013. DDM2 was adapted and piloted in Palau in May 2014. This workshop in Kiribati is the second pilot. DDM3 is in the process of being adapted and will be piloted in October 2014.

2.0 Overview of workshop

2.1 Workshop objectives

The workshop objectives were to:

1. Define epidemiology, uses and outline the general principles
2. Describe basic measurements in epidemiology and calculate basic indices of health status.
3. Describe and explain the various measures of disease frequency- measures of morbidity, mortality, including performing adequate descriptive epidemiology,
4. Describe the concepts of life expectancy, age specific life expectancy, years of potential life lost, disability adjusted life years and person time rates, and age-adjusted rates
5. Outline concepts in public health demography.
6. Describe various sources of data and their limitations
7. Describe methods of scientific enquiry in epidemiology i.e., the concept of study designs in epidemiology; key features and applications, particularly those study designs used commonly in field epidemiology.
8. Explain the principles of data organisation, analysis and presentation
9. Introduction to MS windows file management
10. Undertake the following processes in Excel: save file, add filter, sort, basic formulae, cleaning data, dealing with missing data/data entry errors/outliers, constructing tables/graphs, inserting tables/graphs in word and powerpoint.
11. To understand how to communicate the results of data analysis
12. To understand the differences between Excel and Epi-Info

13. To become familiar with Epi-Info and some of the following functions: create database (questionnaire); enter data/ create filters or check codes; import data from excel; analyse data; present data or report using relevant tools; inserting tables/graphs in word and powerpoint.

2.2 Teaching methods

The workshop emphasized participatory learning through practical 'hands on' group-work activities. The importance of this was emphasized to facilitators prior to the workshop. Sessions were structured so that theoretical understanding was presented in an interactive way, then, taught concepts were reinforced through case studies, practical activities or other interactive learning methods. The balance of theory-to-practical exercises shifted over the course of the training with practical activities becoming more dominant as the week went on. This reflected the progressive learning and skills development of the group with longer and more complex practical activities becoming possible as the week progressed.

2.3 Participants

Thirty-one people participated in the workshop (Table 1) – 58% of participants were female (n=18). Participants were staff from Kiribati Ministry of Health and Medical Service's (MHMS) Environmental Health Unit, Health Information Unit, Health Promotion Unit, Laboratory Services, TB/Leprosy/HIV program, Medical Records, and Public Health Nurses, as well as one staff member from Kiritimati. In addition, there was one participants from the Kiribati Ministry of Foreign Affairs, two participants (one Environmental Health Officer and one Health Information Officer) from Nauru, two from FSM, as well as three SPC staff.

Table 1: Workshop participants, DDM2, Kiribati, September 2014

Name	Sex	Position	Location	Country
Agnes Nauro Nikuata	F	Manager, Reproductive Health	Ministry of Health and Medical Service's	Kiribati
Alfred Tonganibeia	M	Manager, TB/HIV/Leprosy Unit	Ministry of Health and Medical Service's	Kiribati
Anetenu Kateibwi	F	Records/Receptionist, Medical Records	Ministry of Health and Medical Service's	Kiribati
Arite Tetoa	F	Senior National Officer	Ministry of Health and Medical Service's	Kiribati
Bereka Reiher	F	TB Program Coordinator, TB Program	Ministry of Health and Medical Service's	Kiribati
Bereti Terawea	F	Health Promotion Officer, Health Promotion	Ministry of Health and Medical Service's	Kiribati
Bungia Kaitaake	F	Health Inspector, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Bwenateti Teauokui	F	Registered Nurse	Ministry of Health and Medical Service's	Kiribati
David Dowiyogo	M	Planner	Ministry of Health	Nauru
David Teaabo	M	Ministry of Foreign Affairs	Ministry of Foreign Affairs	Kiribati
Eliaser Johnson	M	Head, Primary Health Care Section	Pohnpei Department of Health	FSM
Eliyashib Edward	F	Surveillance Officer, Primary Health Care Section	FSM National Government	FSM
Erei Riimon	M	National Leprosy Program Manager	Ministry of Health and Medical Service's	Kiribati
Gretna Tauma	F	Medical Laboratory Technician, National Laboratory	Ministry of Health and Medical Service's	Kiribati
Katarake Mwekaa	M	Coordinator	Ministry of Health and Medical Service's	Kiribati
Lavinia Koina	F	Assistant Health Inspector, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Manrenga Viane	F	Senior National Officer	Ministry of Health	Kiribati
Maryanne Utiera	F	Asst Statistician, Health Information Unit	Ministry of Health and Medical Service's	Kiribati
Natalie Girin	F	Health Policy, Planning and Regulation Program	Secretariat of the Pacific Community	Noumea
Nenebo Benetito	M	Assistant Health Inspector (Kiritimati)	Ministry of Health and Medical Service's	Kiribati
Salaamo Taing	F	TB Program	Ministry of Health and Medical Service's	Kiribati
Sapina Benitera	F	HIV Program	Ministry of Health and Medical Service's	Kiribati
Tabomoa Tinte	F	Assistant Health Inspector, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Tarome Takaua	F	Health Assistant, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Teanibuaka Tabunga	M	Senior Health Information Officer, Health Information Unit	Ministry of Health and Medical Service's	Kiribati
Tebuka Toatu	M	Laboratory Specialist	Secretariat of the Pacific Community	Pohnpei
Tebikau Tibwe	M	Chief Health Inspector, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Teretia Teitei	F	Assistant Health Inspector, Environmental Health Unit	Ministry of Health and Medical Service's	Kiribati
Tooma Neneia	M	Lector, Nursing School	Ministry of Health and Medical Service's	Kiribati
Vijesh Lal	M	Laboratory Specialist	Secretariat of the Pacific Community	Fiji
Vincent Scotty	M	Health Inspector	Ministry of Health	Nauru

2.4 Facilitators

Seven facilitators were involved in the training. The facilitators were:

- Jojo Merilles – Secretariat of the Pacific Community
- Bev Paterson – Hunter New England Population Health (HNEPH), and the University of Newcastle
- Thane Hancock – Yap State Department of Health Services, Federated States of Micronesia
- Nicola Hodge – University of Queensland HISHub

- Sione Hufanga – Tongan Ministry of Health
- Elise Benyon - Secretariat of the Pacific Community
- Damian Hoy – Secretariat of the Pacific Community

2.5 Logistical support

Tianuare (Kiribati Government and EU-funded GCCA:PSIS Project), and Elise Benyon (Secretariat of the Pacific Community) provided administrative and logistical support for the preparation and implementation of the workshop. Elise Benyon provided additional support to this.

2.6 Description of workshop activities (also see Appendix 1 – Agenda)

Sunday, September 7

On Sunday afternoon, the seven facilitators met to plan the week's activities.

Monday, September 8

The workshop commenced at 8.45am. The workshop was opened by Tebikau Noran, on behalf of the Director Public Health, on Monday morning. An overview of the course background, continuum of training, DDM1 content, outline of DDM2 content, expectations of this course, and outline assessment procedures was presented by Damian Hoy. Thane Hancock then gave a lecture on the general principles of epidemiology – the lecture included a lot of interaction between facilitator and participants. Following this, Nicola Hodge lead all facilitators in a session on basic excel skills where participants were shown a series of important steps and functions and facilitators provided one on one guidance to participants as needed. Damian Hoy then presented the first of a series of four lectures on measures in epidemiology and demography (MED1). This included students undertaking short calculation exercises throughout the lecture. The Mock Survey exercise then commenced with a lecture on data cleaning (MED2a). Students then worked individually through the mock survey exercise in Excel to clean the dataset. A lecture was then given on measures of central tendency and dispersion (MED2b) and students then started to calculate these measures in their MockSurvey datasets. The workshop closed at 4.45pm and facilitators then met (as they did each day throughout the workshop) to discuss the day, what worked well, what didn't work so well, and what they would do differently next time. They also then planned the sessions for the following day.

Tuesday, September 9

The workshop commenced at 8.30am. One of the participants gave a short overview of what they had learnt the previous day. Student then continued with their MockSurvey exercise. Facilitators worked one on one with participants as needed. Damian then went through the calculations from this exercise in a plenary session. Thane then presented a lecture on demographic indicators (MED3). This included students undertaking short calculation exercises throughout the lecture. Following this, Damian gave a lecture on burden of disease, life expectancy and the demographic transition (MED4). After lunch, Nicola gave a session on more advanced Excel skills, including pivot tables. Facilitators provided one on one guidance to participants as needed. The final session of the day was the first session on the 'own datasets' that participants had brought to the training. Participants would work through this dataset for the next 3 days. The exercise was a group exercise – 2 to 3 students per group. They decided on which dataset they would work with. This had to have some relevance to their usual work duties. They cleaned, and commenced analysis of their data. The workshop closed at 5.00pm and facilitators then met to discuss the day and plan the sessions for the following day.

Wednesday, September 10

The workshop commenced at 8.30am with one of the participants giving a short overview of what they had learnt the previous day. Bev Paterson then gave a lecture on data sources, which had a lot of interaction between facilitator and participants. Following this, Jojo Merilles gave a lecture on study design. This too had a lot of interaction between facilitator and participants. Students then continued with their 'own dataset' exercise, which involved continuing with their analysis and commencing visualisation of their results. Bev then gave a lecture on data dissemination and use and then students continued with their 'own dataset' exercise. The workshop closed at 5.00pm and facilitators then met to discuss the day and plan the sessions for the following day.

Thursday, September 11

Again, the workshop commenced at 8.30am with one of the participants giving a short overview of what they had learnt the previous day. Students then spent the next two hours preparing their presentations of their 'own dataset', including interpretation of results, recommendations, and next steps. Following this, students presented the work they had done through the week on their 'own dataset'. Presentations were made on a powerpoint template and presentation groups were 2-3 people. All students had to present an equal proportion of their group presentation. The last session of the day was a review session, where students worked their way through a worksheet that captured the concepts and calculations from the week. Facilitators worked one on one with participants as needed. The workshop closed at 5.00pm and facilitators then met to discuss the day and plan the sessions for the following day.

Friday, September 12

The workshop commenced at 8.30am. Students then spent the next 90 minutes preparing for the practice exam. Facilitators provided one on one guidance to participants as needed. Students then undertook the practice exam (60 minutes). From this, facilitators decided a pass grade of 70%. 16 of the students passed the exam and 15 were less than 70%. The average grade was 70%. After lunch, Sione Hufanga gave a session on Epi-Info7 – he was assisted by Elise Benyon and other facilitators who worked one on one with participants as needed. Following this, Bev Paterson lead a sessions with input from other facilitators, where key concepts from the first three days of the workshop were reinforced and students could ask questions. The workshop closed at 5.00pm and facilitators then met to discuss the day and plan the sessions for the following day.

Saturday, September 13

The workshop commenced at 9.30am. Bev gave participants an evaluation to complete to report on how they viewed the workshop and what skills/competencies they felt they had gained through the week (see results below). All students then undertook the final exam (90 minutes). Following this a session was held by Damian and Elise to prepare students applications for the FNU enrolment, as well as to revisit the DDM1 improvement projects and assess progress. Following lunch, the workshop closed. The official closing ceremony and function was held on Saturday evening where students were presented with certificates of participation.

Important note: by 8.45am of the first day of the workshop, there were 31 participants present in the room. These participants were present for the full duration of the week until the end of the workshop on Saturday lunchtime. There were no drop outs through the week. Students are to be congratulated on their punctuality and conscientiousness.

2.7 Facilitators meetings

These were held at the end of each day after the workshop had closed. Facilitators discussed the day, what worked well, what didn't work so well, and what they would do differently next time. They also then planned the sessions for the following day. Each meeting was facilitated by the day's master of ceremonies (the master of ceremonies was rotated each day). Nicola and Jojo kept minutes of the meetings. All facilitators will update their presentations, sessions, agendas, as per the facilitator meeting notes. Facilitators will have a teleconference by end of October to assess progress towards meeting these action points.

2.8 Workshop evaluation

Bev analysed the results of the workshop evaluation. Detailed results are shown in Appendix 2. In summary, DDM2 course participants were very positive response about the course. All aspects of the course including excel, data analysis, own data, and epidemiology concepts were considered useful. Participants preferred lectures, facilitator assistance and group work in preference to individual work. There was good self-assessed improvement by participants in excel, data cleaning, calculations and understanding own data over the course week. Participants noted that they would find pivots, data entry and cleaning to improve data, data analysis (particularly measures of central tendency, rates, proportions and morbidity and mortality indices) and data interpretation useful in their workplace. They also commented that the data could be used to provide the evidence base and mentioned the need to share data with others, particularly to target audiences. Areas of continued uncertainty at the end of course included study design, epinfo and making graphs.

2.9 Conclusions

The workshop was extremely well-received and successful in achieving its objectives. All participants achieved a score of 70% or greater on the final exam. The evaluation suggests that capacity was strengthened in excel, data cleaning, calculations and understanding own data. The workshop demonstrated that the interactive training methods used in this DDM module is of value as they appeared to transfer knowledge and skills in an effective way. A number of participants have requested DDM3, and possibly DDM4, to take place in 2015.

2.10 Acknowledgements

Funding of DDM2 in Kiribati	Development of DDM2 materials	Delivery of DDM2 in Kiribati
SPC PHD	SPC PHD	SPC PHD
SPC EU GCCA Project	PIHOA	FSM Health
RAPID	CDC	RAPID
UQ HISHub	RAPID	Tonga MoH
	WHO	UQ HISHub
	FNU	

Appendix 1 – Agenda

SCHEDULE	ACTIVITY	TIME (Mins)	TEACHING METHOD	FACILITATOR	DROPBOX FILE
SUNDAY					
3.00pm	Facilitators meeting	120		Damian Hoy	
MONDAY					
8.00am	Registration	30		Elise Benyon	
8.30am	Open, invocation, welcome and introductions	15	Group work	Tebikau Noran	
8.45am	Course background - continuum of training Review of DDM1 content Outline of DDM2 content (incl. data flow chart) Expectations of this course. Outline assessment procedures.	30	Facilitator-led plenary (participatory)	Damian Hoy	1. DDM2 Introduction
9.15am	General principles of epidemiology	60	Facilitator-led plenary (participatory)	Thane Hancock	2. General Principles of Epidemiology; and 2a. General Epi Study Guide
10.15am	*MORNING TEA*	*30*			
10.45am	Excel Refresher I - save file, add filter, sort, basic formula	60	Facilitator-led plenary (participatory)	Nicola Hodge	3. Excel refresher 1
11.45am	Measures in Epidemiology and Demography - part I	45	Facilitator-led plenary (participatory)	Damian Hoy	4. MED 1 ; 4a. MED formulae sheet; and 4b. Quiz questions for MED 1 20140516
12.30pm	*LUNCH*	*45*			
1.15pm	Measures in Epidemiology and Demography - part I (continued)	*60*	Facilitator-led plenary (participatory)	Damian Hoy	4. MED 1 ; 4a. MED formulae sheet; and 4b. Quiz questions for MED 1 20140516
2.15pm	Measures in Epidemiology and Demography - part II - and Mock survey exercise	60	Facilitator-led plenary (participatory) and Group work	All facilitators led by Damian Hoy	5a. MED 2; and 5. Mock survey exercise
3.15pm	*AFTERNOON TEA*	*30*			
3.45pm	Measures in Epidemiology and Demography - part II - and Mock survey exercise	45	Facilitator-led plenary (participatory) and Group work	All facilitators led by Damian Hoy	5a. MED 2; and 5. Mock survey exercise
4:30pm	Adjourn			Facilitators debrief	
TUESDAY					
8.00am	Arrival				
8:15am	Recap Monday sessions		Participant-led plenary	Participants	
8.30am	Measures in Epidemiology and Demography - part II - and Mock survey exercise	75	Facilitator-led plenary (participatory) and Group work	All facilitators led by Damian Hoy	5a. MED 2; and 5. Mock survey exercise
9.45am	Measures in Epidemiology and Demography - part III	75	Facilitator-led plenary (participatory)	Thane Hancock	2. MED 3
11.00am	*MORNING TEA*	*30*			
11.30am	Measures in Epidemiology and Demography - part IV	90	Facilitator-led plenary (participatory)	Damian Hoy	3. MED 4
1.00pm	*LUNCH*	*45*			
1.45pm	Excel Refresher II - Organising and Presenting Data: pivot table, tables, charts	75	Group work	Nicola Hodge	4. Excel Refresher – part II; and 4a. DDM Pivot Table Practice
3.00pm	*AFTERNOON TEA*	*30*			

3.30pm	Introduction of Own Data Set - set the scene for subsequent sessions and presentation on Thursday	60	Group work	All facilitators led by Damian Hoy	5. Own data presentation; 5a. Own data exercise; 5b. PICT datasets overview; 5c. Own data objectives and assessment guide
4:30pm	Adjourn			Facilitators debrief	
WEDNESDAY					
8.00am	Arrival				
8:15am	Recap Tuesday sessions		Participant-led plenary	Participants	
8.30am	Data sources	60	Facilitator-led plenary (participatory)	Bev Paterson	1. Data sources
9:30am	Study Design - to include some scenarios and include audience in choosing best study design	90	Facilitator-led plenary (participatory)	Jojo Merilles	2. Study Design for DDM 2
11.00am	*MORNING TEA*	*30*			
11.30am	Jeopardy	*30*	Group work	All facilitators led by Thane Hancock	
12.00pm	Data dissemination and use	30	Facilitator-led plenary (participatory)	Bev Paterson	3. Data dissemination and use
12.30pm	*LUNCH*	45			
1.15pm	Own data work	105	Group work	All facilitators led by Thane Hancock	5. Own data presentation; 5a. Own data exercise; 5b. PICT datasets overview; 5c. Own data objectives and assessment guide
3.00pm	*AFTERNOON TEA*	*30*			
3.30pm	Own data work	60	Group work	All facilitators led by Thane Hancock	5. Own data presentation; 5a. Own data exercise; 5b. PICT datasets overview; 5c. Own data objectives and assessment guide
4:30pm	Adjourn			Facilitators debrief	
THURSDAY					
8.00am	Arrival				
8:15am	Recap Wednesday sessions		Participant-led plenary	Participants	
8.30am	Own data work (preparation for presentation)	120	Group work	All facilitators led by Thane Hancock	As above
10.30am	*MORNING TEA*	*30*			
11.00am	Own data work presentations	120	Group work	All facilitators led by Sione Hufanga	As above
1.00pm	*LUNCH*	*45*			
1.45pm	Own data work presentations	90	Group work	All facilitators led by Sione Hufanga	As above
3.15pm	*AFTERNOON TEA*	*30*			
3.30pm	Revision session for concepts learnt on first two days	60	Group work	All facilitators led by Thane Hancock	4. DDM2 Measurements Review Session; 4a. DDM2 Measurements Review Session with Answers; 4b. Jeopardy
4:30pm	Adjourn			Facilitators debrief	
FRIDAY					

8.00am	Arrival				
8.30pm	Revision session for concepts learnt on first two days	120	Group work	All facilitators led by Jojo Merilles	4. DDM2 Measurements Review Session; 4a. DDM2 Measurements Review Session with Answers; 4b. Jeopardy
10.30am	*MORNING TEA*	*30*			
11.00am	Exam (step 1)	60		Thane Hancock	
12.00pm	*LUNCH*	*45*			
1.00am	Intro to EpiInfo	90	Group work	Sione Hufanga and Elise Benyon	1. Epi Info 7; 1a. Intro to Epi Info 3
2.30pm	*AFTERNOON TEA*	*30*			
3.00pm	Exam debrief & competency review	90	Group work	All facilitators led by Thane Hancock and Bev Paterson	As above
4:30pm	Adjourn			Facilitators debrief	
SATURDAY					
9.15am	Arrival				
9.30am	Evaluation	30	Group work	Bev Paterson	As above
10.00am	Exam (step 2)	60		Thane Hancock	
11.00am	*MORNING TEA*	*30*			
5.00pm	**Evening function and certificate presentation**				

Appendix 2- Kiribati DDM2 evaluation – summary by Bev Paterson

Location: Kiribati

Dates: 8-13 September 2014 (6 day course plus facilitator briefing on Sun 7th)

Participants: 31 participants from the South and North Pacific (Kiribati, Nauru, FSM)
Facilitators (in no particular order): Bev Paterson (HMRI), Damian Hoy (SPC), Thane Hancock (PIHOA), Jojo Merilles (SPC), Nicola Hodges (UQ HISHub), Sione Hufanga (Tongan MoH), Elise Benyon (SPC)

Timing: Course participants (28/31) completed a post-test/pre-test[1] evaluation on Saturday morning (Day 6), the final day of the course, prior to receiving their exam results.

Objective: The evaluation sought to assess whether:

- teaching methods and content were appropriate
- participants improved knowledge or skills
- participants were likely to change behaviours relating to their own data following the course, and
- areas of continued uncertainty following the course.

Summary: DDM2 course participants were very positive response about the course. All aspects of the course including excel, data analysis, own data, and epidemiology concepts were considered useful. Participants preferred lectures, facilitator assistance and group work in preference to individual work. There was good self-assessed improvement by participants in excel, data cleaning, calculations and understanding own data over the course week. Participants noted that they would find pivots, data entry and cleaning to improve data, data analysis (particularly measures of central tendency, rates, proportions and morbidity and mortality indices) and data interpretation useful in their workplace. They also commented that the data could be used to provide the evidence base and mentioned the need to share data with others, particularly to target audiences. Areas of continued uncertainty at the end of course included study design, epinfo and making graphs.

Quotes:

> "I would usually just do data. Disseminate it without even understanding them, but now I can actually do my data, understand it and will make the rest of the workers, people, stakeholders understand it too."
>
> "This course is very good and important as it assists me to do my work due to dataset easy."
>
> "Course was delivered in a short time - it would help it if they can be covered in two weeks."

[1] In a post-test/pre-test, participants self-assess whether their knowledge or skills have changed (gain of function) during the course.

DDM2 course

Figure 1: Which were the most useful parts of the course to you?

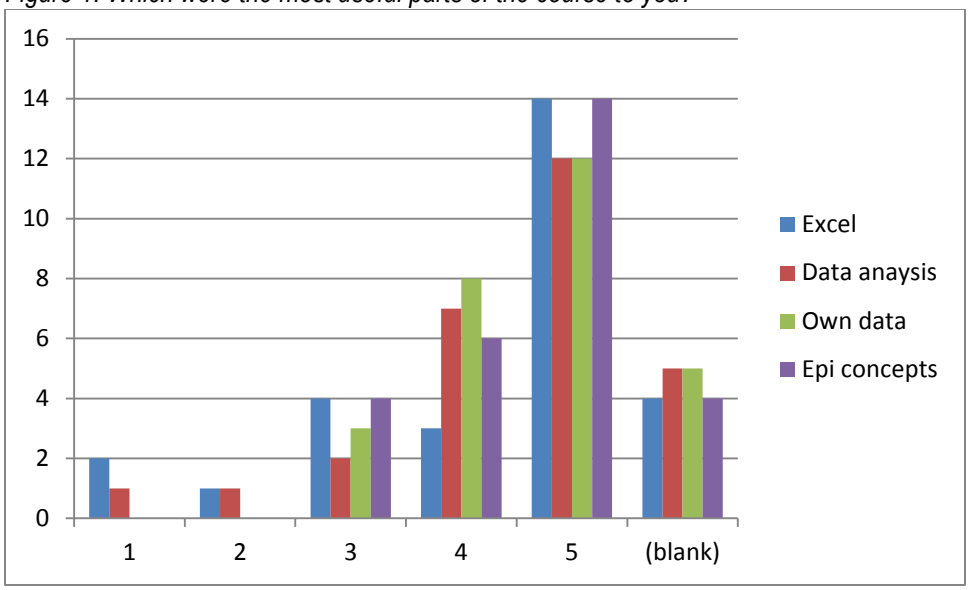
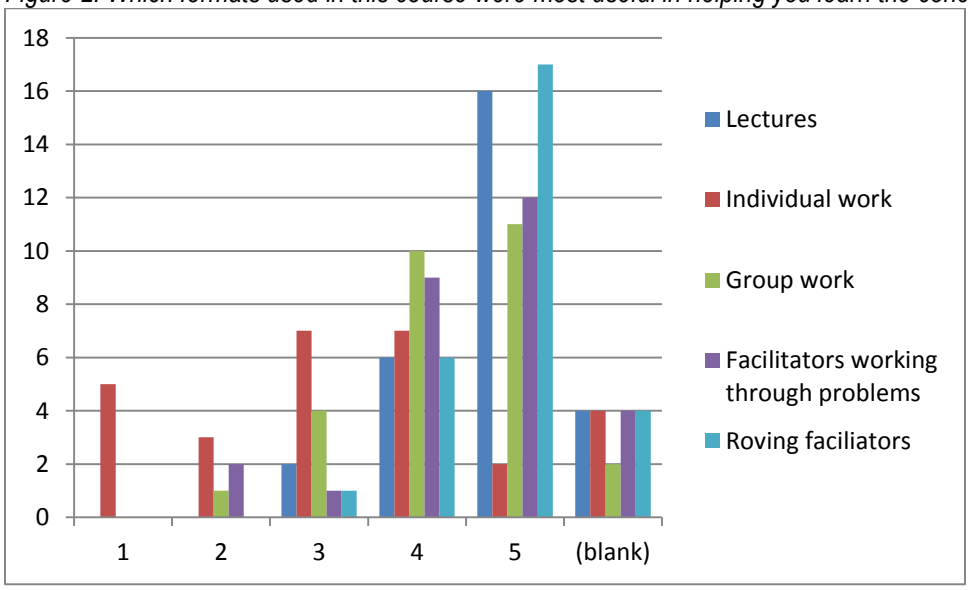


Figure 2: Which formats used in this course were most useful in helping you learn the concepts?



Excel

Figure 3: How would you rate your Excel skills?

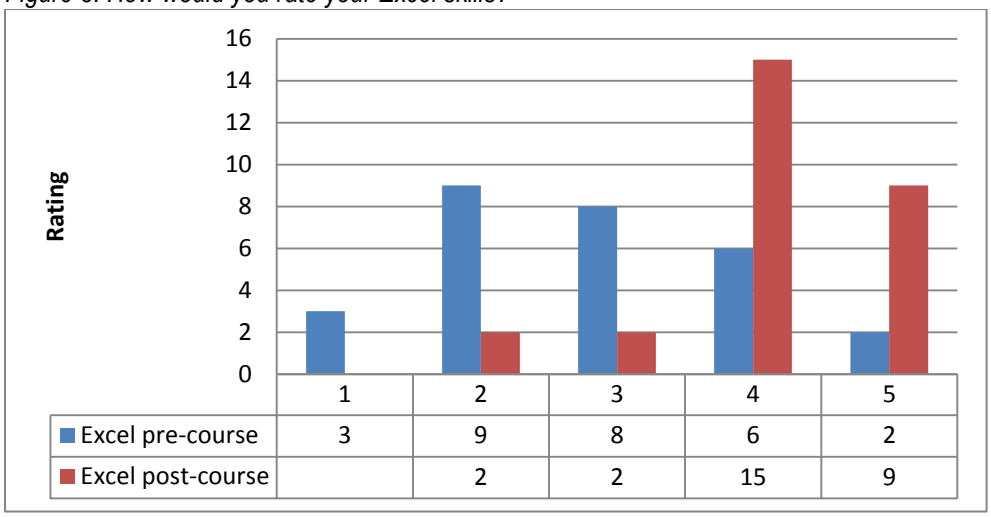
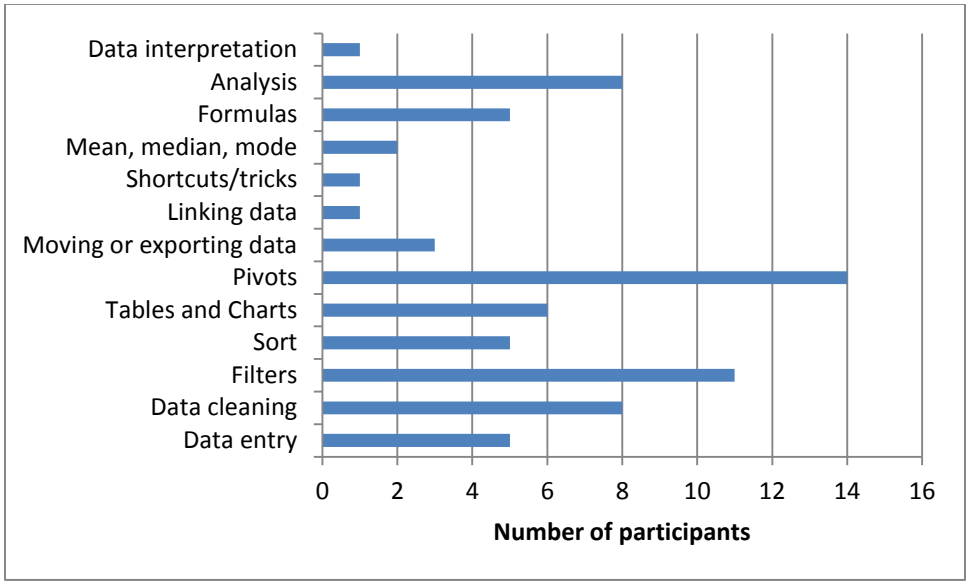


Figure 4: What were the key things you learnt in Excel that you would use in your workplace?



Data

Figure 5: How would you rate your data cleaning skills?

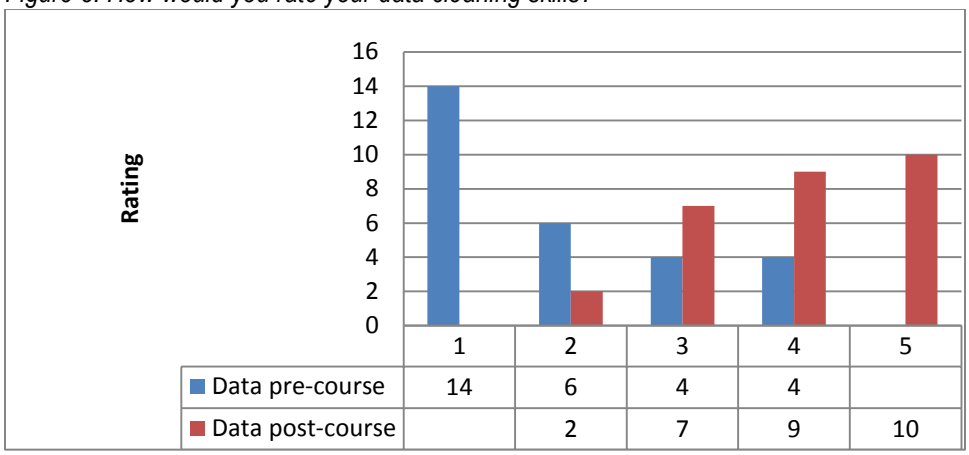
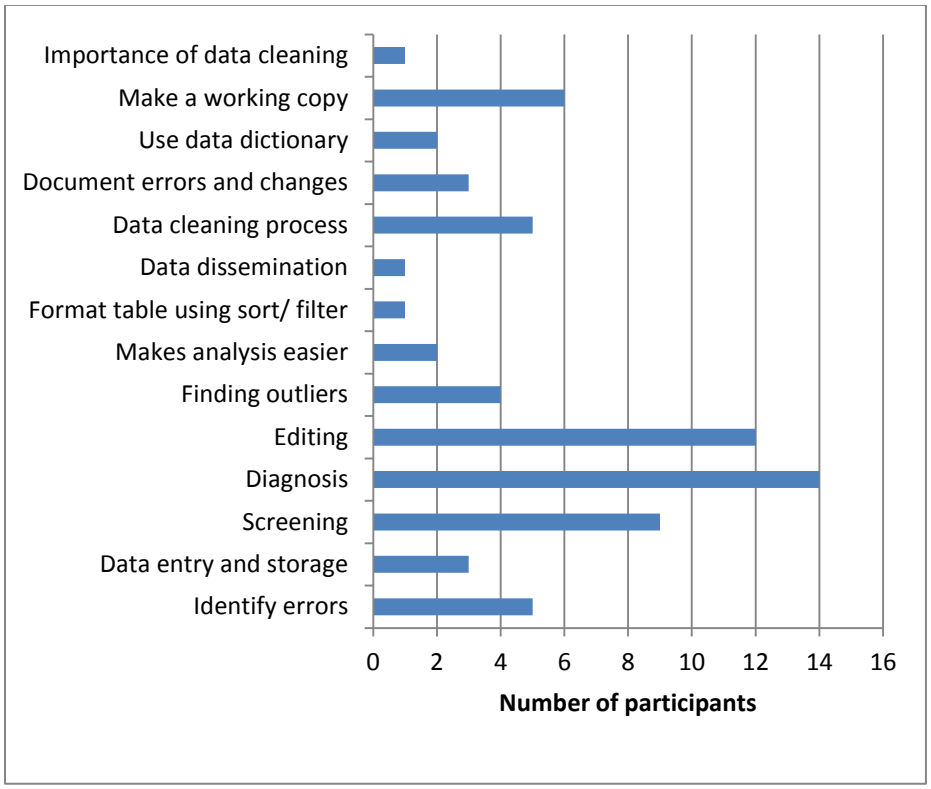
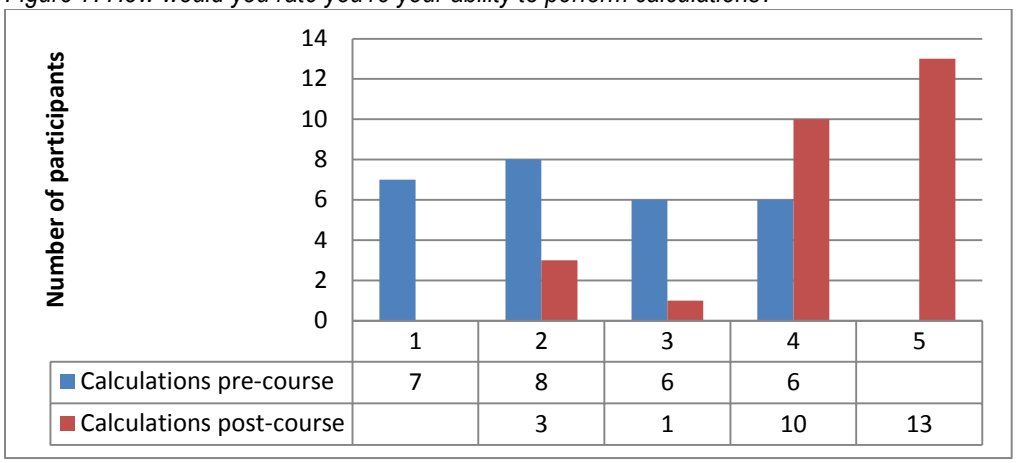


Figure 6: What were the key things you learnt about data cleaning that you will use in your workplace?



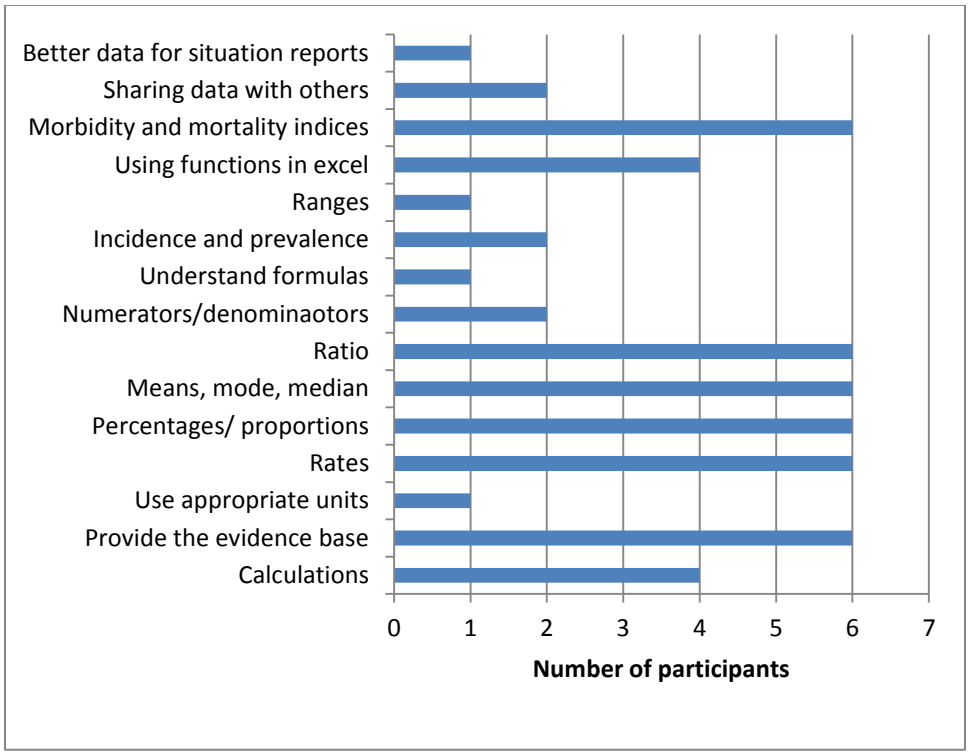
Calculations

Figure 7: How would you rate you're your ability to perform calculations?



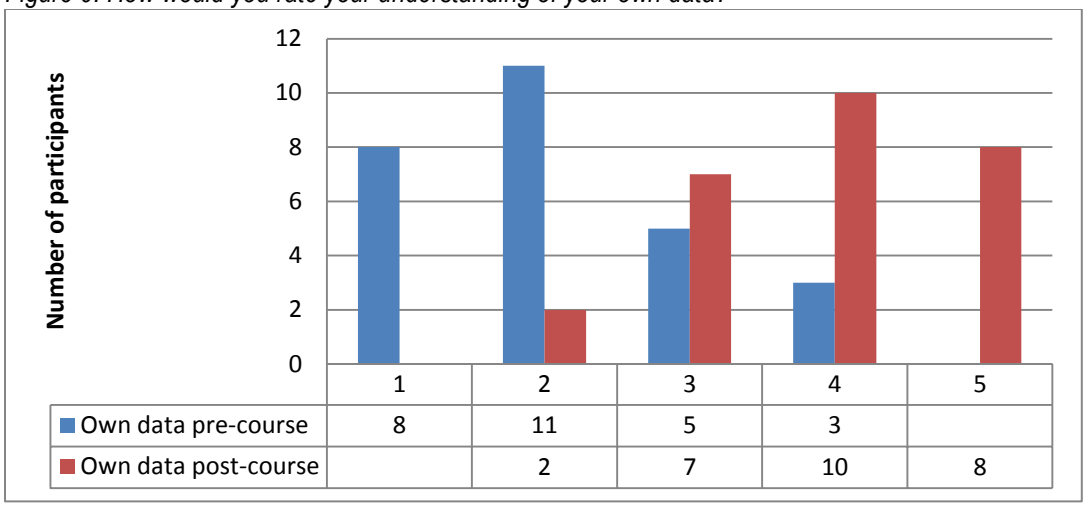
	1	2	3	4	5
Calculations pre-course	7	8	6	6	
Calculations post-course		3	1	10	13

Figure 8: What were the key things that you learnt about any calculations that you will use in your workplace?



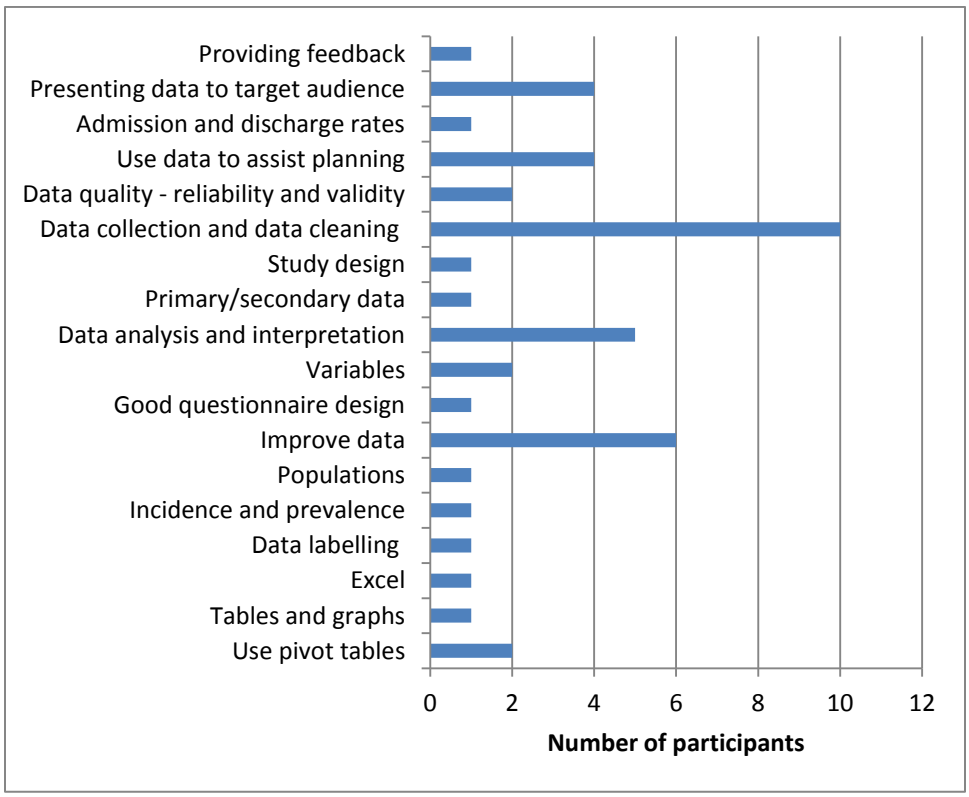
Own data

Figure 9: How would you rate your understanding of your own data?



	1	2	3	4	5
Own data pre-course	8	11	5	3	
Own data post-course		2	7	10	8

Figure 10: What are the key things that you've learnt about your own data that you will use in your workplace?



Continued uncertainty

Figure 11: Is there anything that was covered in the course that you're still unsure about?