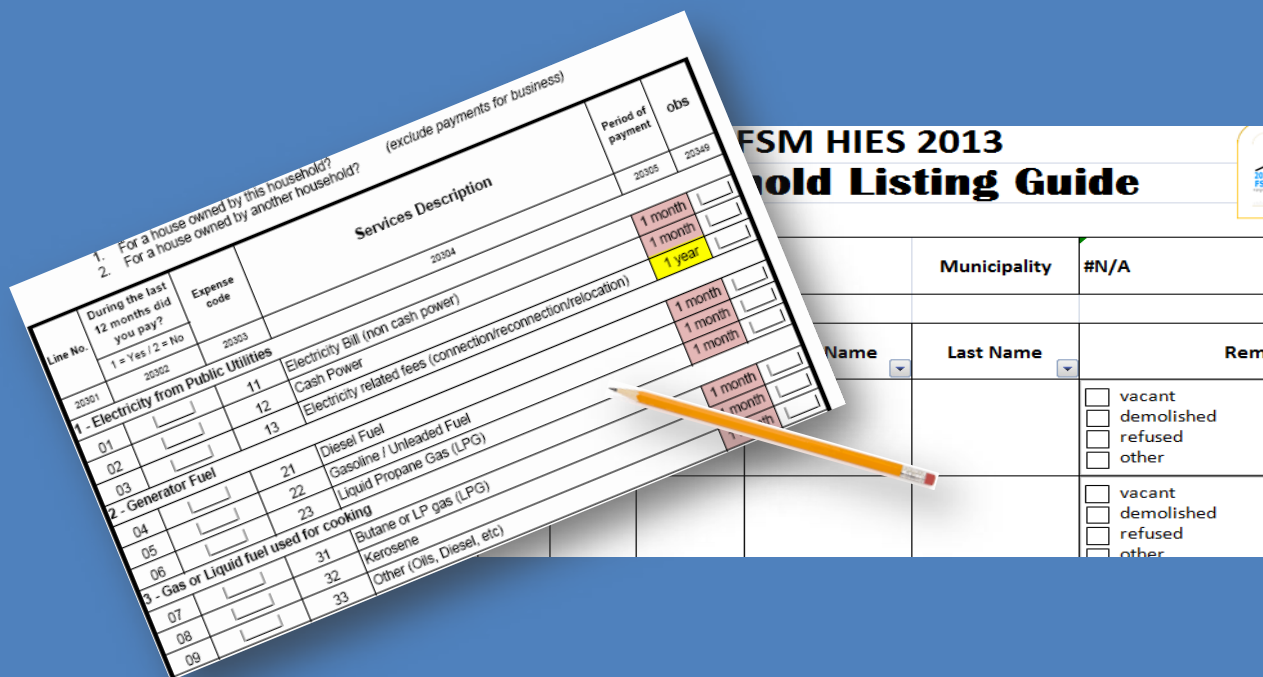


# Federated States of Micronesia

## Household Income and Expenditure Survey 2013/14 Methodological Report (September 2014)



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## SECTION 1 – INTRODUCTORY NOTE

This document provides details of the main methodological issues adopted for the Federated States of Micronesia (FSM) 2013/2014 household income and expenditure survey (HIES). Whilst there are a lot of methodology issues which could be detailed in this report, the focus remains on key issues.

There are three main sections covered in this document which provide information on the following:

**Section 2 – Concepts and Definitions:** In this section some of the information for the expenditure and income definitions is repeated in the main analysis report, but this section also contains additional information on how dwellings and households are defined in the survey along with how household members are determined.

**Section 3 – Survey Procedures:** This section provides important details on various aspects of the survey conducted, including:

- a) the scope/coverage of the survey
- b) the choice of sample frame for the survey
- c) the sample selection procedure
- d) the survey forms adopted
- e) how the data was collected in the field
- f) the data processing procedures
- g) the procedure for weighting survey results.

**Section 4 – Quality of Results:** This section provides details on some of the non-sampling errors associated with the survey results to guide users as to how they should treat the HIES information with caution.

## SECTION 2 – CONCEPTS AND DEFINITIONS

This section of the report addresses some of the key concepts and definitions addressed in the survey. Naturally, for a survey such as a HIES, the two main concepts to be addressed are “Income” and “Expenditure”, but other important concepts and definitions will also be covered.

The areas covered in this section are therefore:

- HIES objectives
- Expenditure/Disbursements
- Income/Receipts
- Dwelling v Household
- Defining Household Members

For income and expenditure, the general concepts of these terms will be discussed; however, more information will also be provided in these sections addressing how the groupings and categories were formed in the income and expenditure analysis in the main analysis report.

### 2.1 HIES objectives

FSM Household Income and Expenditure Survey (HIES) aimed to estimate the total amount household spent and earned over the past 12 months in the country at the national and state level (total expenditure and income - see definition below). In addition to this objective, some socio/demographic information is collected at the individual and household level (e.g., education status...). From those information collected, the three main applications are:

- Update the Consumer Price Index for FSM (based on the final expenditure consumption disaggregated at the commodity level);
- Update the National Account of FSM: based on the different aggregated expenditure (final, investment); and
- Assess the level of poverty in FSM (e.g. % of household who live below the poverty line)

Many additional analyses based on specific sections of the HIES questionnaire can be undertaken (e.g., expenditure pattern, the importance of home produced vs purchased food, focus on education/health/communication profile and expenditure).

## 2.2 Expenditure / disbursements

### 2.2.1 Introduction

The concept of expenditure being adopted for the FSM HIES 2013/2014 is based on Resolution 1 from the Seventeenth International Conference of Labour Statisticians (ICLS) concerning household income and expenditure statistics. In these guidelines, instructions are provided on how both Consumption and Non-Consumption Expenditures are defined as described below:

**Consumer goods and services** are those used by a household to directly satisfy the personal needs and wants of its members. **Household consumption expenditure** is the value of consumer goods and services acquired, used or paid for by a household through direct monetary purchases, own-account production, barter or as income in-kind for the satisfaction of the needs and wants of its members; and

**Household expenditure** is defined as the sum of household consumption expenditure and the **non-consumption expenditures** of the household. The latter are those expenditures incurred by a household as transfers made to government, non-profit institutions and other households, without acquiring any goods or services in return for the satisfaction of the needs of its members. Household expenditure represents the total outlay that a household has to make to satisfy its needs and meet its "legal" commitments.

### 2.2.2 Formation of Main Expenditure Categories

As mentioned above, the concept of expenditure being adopted for the FSM HIES is based on Resolution 1 from the Seventeenth International Conference of Labour Statisticians. For this reason the following broad categories have been adopted for the expense/disbursement tabulations in the main HIES report:

**1. Household Consumption Expenditure:** The value of consumer goods and services acquired, used or paid for by a household through direct monetary purchases, own-account production, barter or as income in-kind for the satisfaction of the needs and wants of its members.

**2. Non-Consumption Expenditure:** Those expenditures incurred by a household as transfers made to government, non-profit institutions and other households, without acquiring any goods or services in return for the satisfaction of the needs of its members.

Other information that will also prove useful in completing the expenditure/disbursement composition of the household includes:

**3. Investment:** Covers expense items incurred by household members for financial security or accumulation of significant assets, such as a house (major alterations/renovation of the house) a boat and all other durables that were purchased for business use.

### 2.2.3 Finer Level Categories for Main Expenditure Analysis

#### **Household Final Consumption Expenditure**

For tabulation purposes, the analysis will separate out Category 1, Consumption Expenditure, into sub-categories (divisions) conforming to the COICOP classification guidelines. This would result in the following 12 divisions being formed in the tables for addressing consumption expenditure:

1. Food and Non-Alcoholic Beverages
2. Alcoholic Beverages, Tobacco and Narcotics
3. Clothing and Footwear
4. Housing, Water, Electricity, Gas and Other Fuels
5. Furnishings, Household Equipment and Routine Household Maintenance
6. Health
7. Transport
8. Communication
9. Recreation and Culture

10. Education
11. Restaurants and Hotels
12. Miscellaneous Goods and Services

### ***Non-Consumption Expenditure***

For Category 2, Non-Consumption Expenditure, the analysis will further split it to create sub-categories of importance to FSM. The six main sub-categories identified for FSM include:

1. Cash Donations to Special Events (e.g., ceremonies)
2. Cash Donations to Households
3. Cash Donations to Church
4. Taxes, fines
5. Donations to association, fundraising
6. Other Donations (e.g., charitable)

Special events cover the household's contributions to things like weddings, funerals, birthdays, etc. The non-consumption expenditure refers more to acts of generosity on behalf of the household where they have provided assistance to the community in some form (e.g., another household, church, village, school, etc.), expect for taxes and fines.

### ***Investment***

For Category 3, Investments, data were only collected under the following sub-categories:

1. Land purchase
2. House construction / major house modifications
3. Purchase of major assets (e.g., water tank, generator, solar panel, boat) and durables for business use
4. Reimbursements of loans related to the house (purchase or renovation)

#### **2.2.4 Type of expense**

To add further value to the analysis, effort has been made throughout the survey to determine how that expenditure was received / paid. Four main categories have been created to establish the manner in which the expenditure was received, which include:

1. Cash/In-kind purchases
2. Home production
3. In-kind receipts
  - 3.1 Bought goods given away to another household
  - 3.2 Home produced items given away to another household
4. Imputed rents

Further explanations for each are provided below.

#### ***Cash/In-kind purchases***

Cash/In-kind purchases represent any purchases made by the household for products or services for which a payment was made by the household. The payment can be made in the form of a cash payment or payment in-kind (i.e. the household pays for the product or service with something other than cash). In the situation where a purchase is made in-kind, the household is required to estimate the value of the item/service they exchanged for their purchase.

#### ***Home production***

Home production in this category covers the value of items which were home produced by the household and then consumed by that household. Any home production sold by the household is not regarded as an expense. In the case of the selected household gave away some home produced items from another household, this will be included in the next category "in-kind receipts".

#### ***In-kind receipts***

In-kind receipts cover non-cash gifts given away by the households which in turn are consumed by other households. This may be a home produced item or an item bought given away.

### **Imputed rents**

Imputed rents cover the value of housing within FSM. They are estimated by the household itself which owns (outright or mortgage), and lives in it for free, following the question: "How much would you expect to receive each month if you rented it?"

## **2.3 Income / receipts**

### **2.3.1 Introduction**

The concept of income being adopted for the FSM HIES 2013/2014 is also based on Resolution 1 from the Seventeenth International Conference of Labour Statisticians (ICLS) concerning household income and expenditure statistics.

Once again, in these guidelines, instructions are provided on how household income should be defined, but more importantly what categories make up household income. For the tabulations in the main analysis report, an additional section addressing Irregular Gifts and Other Receipts is included for completeness, and to make comparisons with Expenditure/Disbursements easier to interpret.

The instructions in the ICLS guidelines for household income is as follows:

*Household income consists of all receipts whether monetary or in kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals, but exclude windfall gains and other such irregular and typically one time receipts. Household income receipts are available for current consumption and do not reduce the net worth of the household through a reduction of its cash, the disposal of its other financial or non-financial assets or an increase in its liabilities.*

*Household income may be defined to cover: (i) income from employment (both paid and self-employment); (ii) property income; (iii) income from the production of household services for own consumption; and (iv) current transfers received.*

To be more consistent with the concept of income used in the national accounts, income from the production of household services for own consumption has been omitted (e.g., home duties as cleaning, cooking) from the tabulations in the Income/Receipts tables in the main analytical report. This is also because the only information collected from this component was for the gross estimated value of housing services provided by owner-occupied dwellings.

### **2.3.2 Formation of Main Income Categories**

As discussed above, the concept of income being adopted for the FSM HIES is based on Resolution 1 from the Seventeenth International Conference of Labour Statisticians, with Category ((iii) above) Income from the production of household services for own consumption, being removed. For this reason the following broad categories have been adopted for the Income/Receipts tabulations in the main HIES report:

1. **Household Income:** Consists of all receipts whether monetary or in-kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals, but excludes windfall gains and other such irregular and typically one-time receipts. Household income receipts are available for current consumption and do not reduce the net worth of the household through a reduction of its cash, the disposal of its financial or non-financial assets or an increase in its liabilities. Four main components of household income are defined here, which include:

- 1.1 **Income from Employment:** Comprises receipts for participation in economic activities in a strictly employment related capacity. It consists of two components:

- 1.1.1 *Employment Income:* Comprises direct wages and salaries for time worked and work done, cash bonuses and gratuities, commissions and tips, directors' fees, profit -sharing



bonuses and other forms of profit-related pay, remuneration for time not worked as well as free or subsidised goods and services from an employer. It may include severance and termination pay as well as employers' social insurance contributions. These items should be reported separately, when included. Employee income may be received in cash (monetary) or in-kind as goods or services.

**1.1.2 Income from Self-Employment:** Is defined as income received by individuals, over a given reference period, as a result of their involvement in self-employment jobs. In particular, income from self-employment concerns, primarily, owners of unincorporated enterprises who work in these enterprises. It excludes profits from capital investment of partners who do not work in these enterprises ("sleeping partners"), dividends and directors' fees paid to owners of incorporated enterprises. Income from self-employment includes the estimated value of goods and services produced for barter as well as goods produced for own consumption, less expenses.

**1.2 Property Income:** Property income is defined as receipts that arise from the ownership of assets (return for use of assets) that are provided to others for their use. These are returns, usually monetary, from financial assets (interests, dividends), from non-financial assets (rents) and from royalties (return for services of patented or copyright material). Interest receipts are payments received from accounts with banks, building societies, credit unions and other financial institutions, certificates of deposit, government bonds/loans, securities, debentures and loans to non-household members. Dividends are receipts from investment in an enterprise in which the investor does not work. Pensions and annuities in the form of dividends from voluntary private insurance schemes are also included. Rents are payments received for the use of both unproduced assets (i.e. natural resources), such as land, and for produced assets, such as houses. Rents should be recorded net of expenses.

**1.3 Transfer Income:** Transfers are receipts for which the recipient does not give anything to the donor in direct return for the receipts. Transfers can consist of cash (in the monetary sense), of goods or of services. Current transfers are those that usually recur regularly (relative to the reference period used for income), tend to be small and are also mostly available for use during the reference period. Regarded as income are all current transfers received in cash and as goods as follows:

- (a) Social security pensions, insurance benefits and allowances generated from government sponsored social insurance schemes (compulsory/legal schemes) such as pensions (including military and overseas pensions), unemployment benefits, sickness benefits;
- (b) Pensions and other insurance benefits from employer-sponsored social insurance schemes not covered by social security legislation (both funded and unfunded) such as education allowance, medical expenses;
- (c) Social assistance benefits from governments (universal or means-tested) which provide the same benefits as social security schemes but which are not provided for under such schemes;
- (d) Current transfers from non-profit institutions (e.g. charities, trade unions, religious bodies) in the form of regular gifts and financial support such as scholarships, union strike pay, union's sickness benefits, relief payments; and
- (e) Current transfer from other households in the form of family payments (alimony, child support) or remittances.

Transfer of housing services between households should be considered as income for the recipient household. Although income includes current transfers received in the form of services from governments and non-profit institutions (social transfers in kind) and in the form of other services from households, the operational definition of income should exclude such transfers until methods exist for valuing them that are widely acceptable.

- 2. Irregular Gifts Received and Other Receipts:** All goods received (in kind) by the household according to their origin (bought or home produced). In addition to that, any other receipts the household may receive will also be covered in this section, and include things like winnings from gambling, sales of assets and Inheritances.

3. **Imputed rents:** this category is counted in both, expenditure and income.

### 2.3.3 Finer Level Categories for Main Income Analysis

#### **Household Income**

For household income, it is desirable to have the three main sub-categories as recommended in the Resolution remain:

- 1.1 Income from Employment
- 1.2 Property Income
- 1.3 Transfer Income

For each sub-category, finer level breakdowns for income analysis will be as follows:

1.1 Income from Employment. The main categories included here are:

1. Wage and Salary Income
2. Income from own business (non-subsistence)
3. Subsistence Income (Handicraft)
4. Subsistence Income (Agriculture)
5. Subsistence Income (Livestock)
6. Subsistence Income (Fishing)
7. Home Production Consumed

An effort has been made to separate out the main subsistence activities into the four main groups identified, in this instance – Fisheries, Agriculture, Livestock and Other (covers home processed food and handicrafts).

1.2 Property Income: As discussed above, property income is income which arises from the ownership of assets. This category has been split into the major types of property income which include:

1. Home Rental
2. Land Lease
3. Other Property Income

Other Property Income will be comprised of interest from financial institutions overseas, interest from money lending and dividends.

1.3 Transfer Income: As discussed above, transfer income covers receipts for which the recipient does not give anything to the donor in direct return for the receipts.

1. Remittances
2. Pensions (from FSM or US including military pensions)
3. Scholarship
4. Other transfer income

#### *Irregular Gifts Received*

As stated above, this category addresses cash and gifts which are received by households, whether it is from other households or other community groups. The categories of most relevance to FSM which are covered in this category are as follows:

1. Ad-hoc Home Production Received
2. Ad-hoc Bought Goods Received
3. Other receipts (sale of assets, inheritance, winnings...)

### 2.3.4 Type of income

To add further value to the analysis, effort has been made throughout the survey to determine how that income was received. Seven main categories have been created to establish the manner in which the income was received, which include:

1. Cash Income
2. Home production
3. In kind receipts – bought goods
4. In kind receipts – home produced items
5. Imputed rents
6. Intermediate expenditure
7. Income in kind

Further explanations are provided below.

#### *Cash Income*

Cash Income will account for most of the income households receive as it will account for the majority of wage and salary income (net), business income, and sales of home production (gross). All receipts from property income and transfer income will also be classified as a cash income source (net).

#### *Home Production Income*

Home Production Income only covers the value of home production that the household produces and consumes themselves. If the household sells the home produce it is categorised as a cash income, as cash was generated from the sale.

#### *In kind – bought goods received*

This section covers all goods and services bought for the benefit of another household, that are counted as both expenditure and income.

#### *In kind – home produced items received*

This section covers all items home produced and given away that are counted as both expenditure and income.

#### *Imputed rents*

Same category as the expenditure section, as imputed rents are counted in both income and expenditure.

#### *Intermediate expenditure*

This category is not an income category but provides some information on intermediate expenditure generated by household business or subsistence activities (fuel for fishing activities, animal feed...). Equipment expenditure from module 4 are not counted as intermediate expenditure.

#### *In-kind Income*

In-kind Income covers all receipts received from employer by the household which was not in the form of cash. This would entail the employer paying the household member, in full or partially, with a gift in-kind instead of cash.

## 2.4 Dwelling vs Household

Often confusion occurs when dealing with the definition of a household and dwelling. For the FSM HIES 2013/2014 the definitions applying to both are:

### *Dwelling*

A dwelling refers to the physical structure in which a person/s resides. The type of structure may vary considerably, and includes the following:

- a) Single structure unit
- b) Block of apartment units
- c) Small dwelling unit attached to a shop

### *Household*

A household refers more to a group of people, and not the physical structure the people live in. Generally speaking, for survey purposes, a household is a group of people who pool their money together and cook and eat together. Often a household is very similar to a family, but the people comprising a household don't have to be related.

### *Treatment in the field*

Based on these definitions, you may have a dwelling being occupied by more than one household, if there are indeed two groups of people that cook and eat separately, living in the same dwelling. This is not too common, but instructions were given to field staff to take care when visiting dwellings to determine if one or more households resided in that dwelling.

It can also be said that one household may be occupying two or more dwelling structures. A good example of that would be a "granny" flat in the back of a dwelling that houses one or more people, but all members of those two structures form the one household, and still cook and eat together.

For the FSM HIES 2013/2014, it was for the household that information was collected, and the sample frame was a list of households (not dwellings) from the last population census.

## 2.5 Defining members of the household

### **Household Head**

The head of household is the person commonly regarded by the household members as their head. The head will often be the main income-earner and decision-maker for the household, but you should accept the decision of the household members as to who is their head. There must be one and only one head in the household. If more than one individual in a potential household claims headship or if individuals within a potential household give conflicting statements as to who is the head of household, it is possible that you are dealing with two or more households (or Multiple Households), rather than one. In such cases, it is extremely important that you apply the criteria provided to define household membership in the survey. If there is any confusion in defining the household head then immediately contact your supervisor to come up with a suitable solution.

### **Household Members for S1.1**

Household members are listed in two separate parts of the survey:

1. S1.1: Those persons who are considered a member of the household at the point of the survey
2. S1.6: Those persons who were considered a member of the household in the last 12 months, but no longer are.

Defining the members of the household in S1.1 is a very important aspect of the survey. It is extremely important during the analysis phase of the survey, and as such, time should be taken to making sure the following criteria are followed:

*Who to include:*

- All persons currently living in this household as their main place of stay, who share common living arrangements from an economic perspective (share costs of living and share incomes to some degree)
- Persons who are temporarily away for business, work or illness, but meet criteria 1 in that this is their usual place of stay
- Students who are staying away from home for studies and are still reliant on this household for financial assistance, and plan to return to this household after studies, if:
  - They are staying overseas, regardless of accommodation type, or
  - They are staying in a school/college dormitory within country
- Persons staying in hospitals long term, but still plan to come back to the household, and still have a dependency on the household from which they come
- Persons who are overseas for lengthy periods of time for work in order to support the household, and expect to return to the household on completion of this work. Examples include:
  - Seafarers
  - Seasonal workers
- Persons who alternate between household on a regular basis, but spend most time at this household
- Visitors who are staying with the household for 6 months or more

*Who to exclude*

- Persons who spend most of their time living in another household
- People who have left the household with no intention of returning
- Students who are dependent on this household but away long term and staying with a host family elsewhere in FSM

Household Members for S1.6

As stated above, the second list of household members collected in S1.6 of module 1, covers those members of the household who used to be a member of the household in the last 12 months (based on the criteria above), but now no longer are, and have no intention of returning. Two typical examples include:

- 1) Members of the household who have died in the last 12 months
- 2) Members of the household who have moved elsewhere with no intention of returning

## 2.6 Structure of HIES tables

### 2.6.1 Expenditure tables

Total Household Expenditure is presented in 3 different categories:

#### 1. Household Final Consumption Expenditure (HFCE)

- Section 1: final consumption expenditure in cash and in kind (COICOP). All goods and services paid by the household for their own consumption
  - ⇒ All goods and services paid for the benefit of this household that belong to COICOP (division 01 to 12) – all expenditure section (module + diary)
- Section 2: all goods home produced and consumed by the household
  - ⇒ All goods home produced and consumed by the household (diary home production questionnaire 5.5 - section1)
- Section 3: all goods and services bought by the households for the benefit of another household (items purchased and given away)
  - ⇒ All goods and services paid for the benefit of another household that belong to COICOP (division 01 to 12) – all expenditure section (module + diary)
- Section 4<sup>1</sup>: all home produced items given away to another household (items home produced and given away)
  - ⇒ All goods home produced given away (diary home production questionnaire 5.5 section3)
- Section 5: estimation of imputed rents
  - ⇒ All estimation of rents for owners and people who live in their main house for free (questionnaire 2.2)

#### 2. Household Non Consumption Expenditure (HNCE)

- Section 6: all one way cash transfers made by the households (collected in both diaries 5.2 and questionnaire module 2.9, 2.10 & 2.12)

#### 3. Household Investment Expenditure (HIE)

- Section 7:
  - ⇒ Purchase of land/house (questionnaire module 2.4)
  - ⇒ House construction (questionnaire module 2.4)
  - ⇒ House improvement (questionnaire module 2.4)
  - ⇒ Plant equipment (generators & solar panel from questionnaire section 2.5, boat from questionnaire module 2.6) and all durables bought for private use or both purposes (private and business) from questionnaire module 2.4, 2.5 & 2.6
  - ⇒ Mortgage repayment (questionnaire module 2.11, only the loan repayments that refer to the house)

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<sup>1</sup> Group 3&4 together represent the goods given away by the households. The section on items received for free (diary section 5.4) has been dropped in this analysis for the following reasons:

- Many items received for free are related to process food and might include some double account (e.g., the household bought rice & chicken, cooked it and gave some away to another household)
- It is more logical to keep the “given away” approach instead of the “received as a gift” as the household who give away have a better idea of the price of the item, moreover we keep the detail about home production/purchase item

Table1 shows the expenditure part of household account (7 sections). The overall expenditure is broken down into 3 categories (consumption, non-consumption & investment) and 4 different types of expenditure (cash/in kind, home production, gift and estimated imputed rents).

**Table1: household expenditure breakdown – sections & sub sections**

Total expenditure		Purchase for the benefit of the hh		Home production Consumed by the hh		Gift given away/ received by the hhs		Estimated imputed rents			
		Sect.	Sb sct	Sect.	Sb sct	Purchased		Home produced			
						Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct
<b>Consumption expenditure (COICOP)</b>											
01	Food & no-alco drink	Section 1	1.01	Section 2	2.01	Section 3	3.01	Section 4	4.01	Section 5	Na
02	Alcohol, tobacco...		1.02		2.02		3.02		4.02		Na
03	Clothes & footwear		1.03		Na		3.03		Na		Na
04	Housing & utilities		1.04		2.04		3.04		4.04		Na
	Inc. imputed rents		Na		Na		Na		Na		5.04
05	Furnishing equip...		1.05		2.05		3.05		4.05		Na
06	Health		1.06		Na		3.06		Na		Na
07	Transport		1.07		Na		3.07		Na		Na
08	Communication		1.08		Na		3.08		Na		Na
09	Recreation & culture		1.09		Na		3.09		Na		Na
10	Education		1.10		Na		3.10		Na		Na
11	Restaurants & hotels		1.11		Na		3.11		Na		Na
12	Miscel goods &serv	1.12	Na	3.12	Na	Na					
<b>Non-consumption expenditure (one way cash transfers)</b>											
01	Ceremonies	Section 6	6.01	Na	Na	Na	Na	Na			
02	Donation to hhs cash		6.02	Na	Na	Na	Na				
03	Donation to Church		6.03	Na	Na	Na	Na				
04	Taxes, fines		6.04	Na	Na	Na	Na				
05	School, community...		6.05	Na	Na	Na	Na				
06	Other charitable		6.07	Na	Na	Na	Na				
<b>Household Investment</b>											
01	Purchase land/house	Section 7	7.01	Na	Na	Na	Na				
02	House construction /improvement		7.02	Na	Na	Na	Na				
04	Plant, equipment		7.04	Na	Na	Na	Na				
05	Mortgage payments		7.05	Na	Na	Na	Na				

## Origin of expenditure transactions

### Module2

- M2.2 – Housing tenure expenditure
- M2.3 - Utilities expenditure
- M2.4 – Land & housing expenditure
- M2.5 – Households assets expenditure
- M2.6– Vehicles expenditure
- M2.7 – Household private travels expenditure
- M2.8 – Household services expenditure
- M2.9 – Cash contribution to special occasions
- M2.10 - Financial support
- M2.11 – Loans
- M2.12 – Assets Insurance & taxes
- M2.13 – Personal insurance

### Module3

- M3.1.1 – Pell Grants & scholarships
- M3.1.2 – Education expenditure
- M3.2 – Health expenditure
- M3.3 – Clothing expenditure
- M3.4 – Communication expenditure

### Diary

- D5.1 – items bought this day (food & non-food) for the household or for the benefit of others
- D5.2 – payments for services purchased and donation of money
- D5.5 – items home produced (consumed section1 & given away section3)

Each single commodity has only 1 source of collection in the final dataset. It happens in many cases that the modules transactions can conflict with the same transactions reported in the diary (for example rents for house are collected in M1.5 but might appear in diary as well). In such situation, the module transactions are selected and the same commodities collected in the diary are dropped.

**Commodity expenditure data collected in the module is used for expenditure calculation, so the same commodities collected in the diary are dropped. Transactions collected in the diary are kept only if they are only kept if they are not mentioned in the modules.**



Table2: origin of the expenditure transaction by group of expenditure

Total Household Expenditure		Purchase for the benefit of the hh	Home production Consumed by the hh	Gift given away by the hhs		Estimated imputed rents
				purchased	Home Prod	
Consumption expenditure (COICOP)						
01	Food & no-alco drink	D 5.1	D 5.5 (sec1)	D 5.1	D 5.5 (sec3)	Na
02	Alcohol, tobacco...	D5.1	D 5.5 (sec1)	D5.1	D 5.5 (sec3)	Na
03	Clothes & footwear	M3.3/D5.1	Na	M3.3/D5.1	D 5.5 (sec3)	Na
04	Housing & utilities	M(2.2,2.3,2.4)/D5.1	D 5.5 (sec1)	M(2.2,2.3,2.4)/D5.1	D 5.5 (sec3)	Na
	Inc. imputed rents	Na	Na	Na	Na	M2.2
05	Furnishing equip...	M(2.5/2.8)/D5.1/5.2	D 5.5 (sec1)	M(2.5/2.8)/D5.1/5.2	D 5.5 (sec3)	Na
06	Health	M3.2/D(5.1,5.2)	Na	M3.2/D(5.1,5.2)	Na	Na
07	Transport	M(2.6,2.7)	Na	M(2.6,2.7)	Na	Na
08	Communication	M(2.1,3.6)	Na	M(2.1,3.6)	Na	Na
09	Recreation & culture	M(2.5)/D(5.1,5.2)	Na	M(2.5)/D(5.1,5.2)	Na	Na
10	Education	M3.1	Na	M3.1	Na	Na
11	Restaurants & hotels	M(2.7)/D(5.1,5.2)	Na	M(2.7)/D(5.1,5.2)	Na	Na
12	Miscel goods & serv	M(2.12,2.13)/D5.1	Na	M(2.12,2.13)/D5.1	Na	Na
Non-consumption expenditure (one way cash transfers)						
01	Ceremonies	M(2.9)	Na	Na	Na	Na
02	Donation to hhs cash	M(2.10)/D(5.2)	Na	Na	Na	Na
03	Donation to Church	M(2.10)/D(5.2)	Na	Na	Na	Na
04	Taxes, fines	M(2.12) / D(5.2)	Na	Na	Na	Na
05	Donation to school, community....	M2.10	Na	Na	Na	Na
06	Other charitable	M2.10	Na	Na	Na	Na
Household Investment						
01	Purchase land/house	M2.4	Na	Na	Na	Na
02	House construction /improvement	M2.4	Na	Na	Na	Na
03	Plant, equipment	M2.4/M2.5/M2.6	Na	Na	Na	Na
04	Mortgage payments	M2.11	Na	Na	Na	Na

## 2.6.2 Income tables

In parallel, Table 3 shows the income part of the household account. As with total expenditure, total income is broken down in 5 main categories (employment income, property income, household production of services, and 2 categories for transfer: regular and casual) consisting of 11 sections.

- Employment income:
  - o Gross income – section 8: this group is applicable to all the self-employment business, home business and subsistence business. Only gross amount are declared in these categories
  - o Intermediate expenditure – section 9: all the intermediate costs (excluding equipment & investment) incurred by the home/subsistence business
  - o Net income – section 10: the difference between gross income and intermediate expenditure. Only wages and salaries are reported net.
  - o Income in kind – section 11: all extra benefits in kind received from the employer in the context on wage jobs (e.g., housing....). All those benefits are estimated.
  - o Home production – section 2: this group belongs to both expenditure and income. All the items home produced that are estimated by the producer.
- Capital income:
  - o Section 12: all net income that come from property (rents, royalties) & investment (sales of bounds...).
- Household production of services
  - o Section 5 – imputed rents: this group belong to both income and expenditure. All the estimated amounts are provided by the respondent.
- Transfer income:
  - o Section 13: all the regular cash transfers received (provident fund, remittances...).
- Casual income:
  - o Section 14: all non-irregular cash income received (sale of goods, gamble winnings, inheritance...).
  - o Section 3&4: all items received for free. These groups belong to both income & expenditure.

Table3: household income breakdown – Section &amp; sub-sections

Total income		Gross income		Intermediate expenditure		Net Income		In kind income		Home production (Net)	
		Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct
Employment income											
01	Wage & salary	Na		Na		10.01		Section 11 11.1		Na	
02	Income from own business	8.02		9.02		10.02		Na		Na	
03	Subsistence – agricult.	8.03		9.03		10.03		Na		Na	
04	Subsistence – handicraft	8.04		9.04		10.04		Na		Na	
05	Subsistence – livestock	8.05		9.05		10.05		Na		Na	
06	Subsistence – fishing	8.06		9.06		10.06		Na		Na	
07	Home production - consumed	Na		9.07 <sup>2</sup>		Na		Na		Section 2 2.01 /2.02	
Property income											
01	Rental	Na		Na		Section 12.01		Na		Na	
02	Other property income	Na		Na		12 12.02		Na		Na	
Household production of services income											
01	Imputed rents	Na		Na		Section 5 5.04		Na		Na	
Regular transfer income											
01	Remittances	Na		Na		Section 13.01		Na		Na	
02	Pensions	Na		Na		13.02		Na		Na	
03	Scholarship	Na		Na		13.03		Na		Na	
04	Other transfer	Na		Na		13.04		Na		Na	
Irregular gift received											
01	Bought items given away	Na		Na		Na		Section 3 3.01 to 3.12		Na	
01	Home produced items given away	Na		Na		Na		Section 4 4.01 to 4.12		Na	
02	Other casual income	Na		Na		Section 14 14.1		Na		Na	

<sup>2</sup> Intermediate expenditure for home production is derived using all the intermediate expenditure related to subsistence activities collected in module4 (excluding equipment) for the household who did not sell any items within all subsistence activities section (meaning the focus is only on households who do not make money with subsistence activities)

## Origin of income transactions

### Module2

M2.2 – dwelling tenure (imputed rents)

### Module3

M3.1.1 – Pell grants & scholarship

### Module4

M4.1 – income from wage & salary

M4.2 – income from non-subsistence business

M4.3 – income from agricultural activities

M4.4 – income from handicraft activities & food processed at home

M4.5 – income from livestock activities

M4.6 – income from fishing activities

M4.7 – income from property, transfer & casual

M4.8 – remittances

### Diary

D5.1/5.2 – items bought this day (food & non-food) for the benefit of another household

D5.3 – payments for services for the benefit of another household

D5.5 section1– items home produced (consumed)<sup>3</sup>

D5.5 section3 – items home produced (given away)

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<sup>3</sup> Home production sold is taken from the modules

Table4: origin of income – Sections & sub-sections

Total income		Gross income		Intermediate expenditure		Net Income		In kind income		Home production consumed	
		Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct	Sect.	Sb sct
Employment income											
01	Wage & salary	Na		Na		M4.1		Section 11	M4.1	Na	
02	Income from own business	M4.2		M4.2		M4.2		Na		Na	
03	Subsistence – agricult.	M4.3		M4.3		M4.3		Na		Na	
04	Subsistence – handicraft	M4.6		M4.6		M4.6		Na		Na	
05	Subsistence – livestock	M4.5		M4.5		M4.5		Na		Na	
06	Subsistence – fishing	M4.4		M4.4		M4.4		Na		Na	
07	Home production - consumed	Na		M4.3/4.4/4.5		Na		Na		Section 2	D5.5 (sec1)
Property income											
01	Rental	Na		Na		M4.7		Na		Na	
02	Other property income	Na		Na		M4.7		Na		Na	
Household production of services income											
01	Imputed rents	Na		Na		M2.2		Na		Na	
Transfer income											
01	Remittances	Na		Na		M4.8		Na		Na	
02	Pensions	Na		Na		M4.8		Na		Na	
03	Scholarship	Na		Na		M4.7		Na		Na	
04	Other transfer	Na		Na		M4.7		Na		Na	
Irregular gift received											
01	Bought items given away	Na		Na		Na		D5.1/5.2		Na	
01	Home produced items given away	Na		Na		Na		D5.5 sect3		Na	
02	Other casual income	Na		Na		M4.7		Na		Na	

## SECTION 3 – SURVEY PROCEDURES

This section of the report addresses the key procedural issues associated with FSM2013/2014 HIES. Whilst there are many issues which could be addressed in this section, focus will only be placed on the following six key issues:

- Scope and Coverage
- Sample Design
- Survey Questionnaire
- Data Collection Strategy
- Data Processing
- Benchmarks and Weighting

### 3.1 Scope and coverage

The FSM 2013/14 HIES only covered persons who were considered usual residents of private dwellings.

A household was considered in scope for the survey if they had resided in FSM for the last 12 months or more, or if not, they intend to live in FSM for the next 12 months. Households who didn't meet either of these two criteria were excluded from the survey.

Example of eligible households:

- *Just married couple who have been living together since the wedding three months ago*
- *Expat family just arrived last month for a three-year contract in FSM*
- *Expat family who has been living in FSM for two years*

Example of non-eligible households:

- *Expat male who rents a house in FSM, arrived last month and plans to stay for six months*
- *All short-term visitor*

### 3.2 Sample design

#### 3.2.1 Scope reductions

Due to the expenses associated with covering very remote areas, it can be desirable to leave these areas out of the sample frame when selection is undertaken. Whilst this is not desirable from the point of view of producing the best national and state estimates, significant costs were saved by removing these areas, and they only represent a small proportion of the population from each state.

Examples of such areas are those islands within each state which require a ship to access, which can be unreliable, and potentially required the enumerators covering those areas to stay there for lengthy periods at a time.

In order to determine which areas/islands to exclude from the scope of the survey, each statistics state manager was asked to identify such areas which would be extremely difficult to cover. The following table shows the extent of the population excluded from the sample frame within each state.

Table1 – scope reduction FSM HIES 2013/2014

State	Total H'holds	In Scope	Percentage
Yap	2,311	2,255	97.6%
Chuuk	7,024	6,263	89.2%
Pohnpei	6,288	6,197	98.6%
Kosrae	1,143	1,143	100.0%
<b>TOTAL</b>	<b>16,766</b>	<b>15,858</b>	<b>94.6%</b>

As can be seen from table1, 94.6 per cent of households across FSM are in-scope of the survey. Chuuk with only 89.2 percent of households in scope had the lowest representation, whilst Kosrae had all households in scope for the survey. In order to account for the scope reductions, each of the effected states were divided into stratum (see section 2.4 below for more detail) which split the states into 3 area types (ED: Enumeration District):

- EDs with good access to services and facilities
- EDs with limited access to services and facilities
- EDs with rare access to services and facilities

EDs which were considered out-of-scope only occurred in the areas which had rare access to services and facilities. In order to appropriately represent these areas, weights were produced at the stratum level, and adjustments were made to account for scope reductions.

### 3.2.2 Reporting requirements

The reporting requirements for a survey are the level for which results need to be produced. Examples of different levels for a country like FSM include:

- National
- State
- Urban/Rural
- Municipality

Whilst it would be ideal to produce results at the finer levels, due to sample size restrictions for the survey, it is only feasible to produce results at the National and State level. Producing results at the State level should also ensure results of suitable accuracy for Urban/Rural, although these areas need to be properly defined first.

### 3.2.3 Stratification

As discussed above, each State, with the exception of Kosrae, was divided into 3 regions based on accessibility to services and facilities. The justification behind this was that these 3 regions within each of Yap, Chuuk and Pohnpei would be expected to have quite different income and expenditure habits, and it is desirable to represent each of these areas appropriately in the sample design.

So the resulting 10 stratum adopted for the 2013/14 FSM HIES are:

- 1.1) Yap – Good Access
- 1.2) Yap – Medium Access
- 1.3) Yap – Rare Access

- 2.1) Chuuk – Good Access
- 2.2) Chuuk – Medium Access
- 2.3) Chuuk – Rare Access
- 3.1) Pohnpei – Good Access
- 3.2) Pohnpei – Medium Access
- 3.3) Pohnpei – Rare Access
- 4.1) Kosrae

### 3.2.4 Sample Size and Allocation

The sample size adopted for the 2005 HIES was around 10 percent which was allocated to states in a way that saw the smaller states (Kosrae and Yap) receive a higher sample fraction. Given there was sample loss of around 200 households, this resulted in a final sample fraction of 8.4 percent.

For the 2013/14 FSM HIES, it was decided by the Technical Working Group (TWG), which comprised of members from Statistics Division and the Statistics State Managers, that a responding sample of 10 percent would be desirable. In order to achieve this, undertake the following steps:

- 1) Allocate a 10 percent responding sample to each of the 4 states proportional to the square root of the population (households)
- 2) Distribute this sample to each stratum, separately within state, proportional to the stratum population for that state
- 3) Increase each stratum sample size to allow for 15 percent sample loss
- 4) Adjust each stratum sample to allow for workload sizes of 10 households, also topping up the “good access” stratum where variability in survey responses is expected to be greater

The final sample size for each stratum (with the corresponding sample fraction) can be found in Table2 below.

Table2 – Sample size allocation per stratum

State	Stratum	Households	Sample	Sample fraction Stratum	State
Yap	1 Good access	270	120	44.4%	17.3%
	2 Medium access	1,390	200	14.4%	
	3 Rare Access	651	80	12.3%	
Chuuk	1 Good access	2,019	240	11.9%	10.4%
	2 Medium access	3,353	320	9.5%	
	3 Rare Access	1,580	160	10.1%	
Pohnpei	1 Good access	2,753	280	10.2%	10.2%
	2 Medium access	3,126	320	10.2%	
	3 Rare Access	409	40	9.8%	
Kosrae	1 Good access	1,143	240	21.0%	21.0%
Total		16,694	2000	12.0%	



### **3.2.5 Sample Selection**

The sample selection strategy for the FSM 2013/14 HIES was a stratified two-stage design, with the stratification being outlined in the section above.

The two-stages adopted for each stratum included the following:

Stage 1: Select a sample of EDs from each stratum using Probability Proportional to Size (PPS) sampling, where the size measure is the number of household within each ED.

Stage 2: Select a cluster (10) of households from each selected ED using systematic sampling, once the households had been ordered by geographical position within the ED.

### **3.2.6 Field staff requirements**

HIES Staff in the states was not be expected to undertake all the field work. As such, additional interviewers and supervisors were required throughout the course of the project to assist with this work. Given the survey is expected to run over the course of 12 months, and interviewers enumerated more than one workload (10 households), the number of additional field staff was significantly lower than the last HIES conducted in the FSM.

Having said that, some Statistics State Managers made it clear during the HIES planning workshop that field work would be a lot more successful if interviewers were working in areas which they were familiar with and the households would thus be more welcoming. For this reason, many interviewers were not required for the full 12 months of field work, if there was not sufficient work in their areas to justify it.

Statistics State Managers were therefore given the task of dividing their respective states into areas to identify the final number of interviewers (and thus supervisors) which would be required to complete the field work for their state over the 12 months.

From a supervision perspective, additional supervisors were considered only necessary if it was felt the state statistics office was not capable of providing supervision to those areas. Especially with the Outer Islands, it was felt for cost reasons also, that the state statistics office could supervise this work from their main office.

Table3 - Expected number of additional Supervisors & Interviewers

Area	Work Loads to cover	Additional Supervisors Required	Additional Interviewers Required
<i>Yap</i>			
Proper	36	1	8
Outer Islands	6		4
<i>Chuuk</i>			
Weno	24	1	2
Lagoon	36	1	14
Outer Islands	12		9
<i>Pohnpei</i>			
Proper	68	2	6
Outer Islands	4		4
<i>Kosrae</i>			
Proper	24		5
<b>TOTAL</b>	<b>210</b>	<b>5</b>	<b>52</b>

### 3.3 Survey questionnaires

A total of five forms were used for the survey:

- 1) Module 1: Demographics information
- 2) Module 2: Household Expenditures
- 3) Module 3: Individual Expenditures
- 4) Module 4: Income
- 5) Diaries: Two 1-week

For the four modules, face-to-face interviews were conducted with the household, with the household head generally providing the majority of information, but also when required, other household members. These interviews took place over a two-week period whilst the household was required to complete the two 1-week diaries. For these diaries, they were delivered just prior to each 1-week period. After instructions were provided by interviewers on how to complete the diaries, they were left with the household for self-enumeration.

These forms can be found in Appendix B of this report.

Some more detail about the information contained in these forms is as follows:

#### *Module 1: Demographics Information*

As its name suggests, this module is responsible for collecting basic demographic information from each member of the household. The demographic information collected from each member includes age, sex, and relationship to household head, country of birth, marital status and ethnicity. Also from each individual aged 15 years and over, information is sought about what their main activities were in the last week, assisting with providing valuable information about the labour force of FSM. In addition to the basic demographics and labour force question, sections on education status, health status, communication status were asked at individual level.

The last section of this module collected the list of household member who used to live in this household within the last 12 months but left the day of the interview (or passed away).

## *Module 2: Housing characteristics & Household Expenditures*

The dwelling information is collected in two parts, the first of which collects information about the dwelling description, as well as access to electricity, water and sanitation. The second part collects information on the dwelling tenure of the occupants of the dwelling. In this part all households are required to state whether they “own the dwelling outright”, “pay rent” or “live in the house rent free”. Once that has been determined, information about the housing costs is collected.

In addition to this, module2 collects all the expenditure at household level, ten main topics are addressed which cover:

1. Utilities and Communication
2. Land and Housing
3. Household goods and assets
4. Vehicle and accessories
5. Private travels
6. Household services
7. Contributions to special occasions (ceremonies)
8. Provisions of financial support
9. Loans
10. Household assets insurances & taxes
11. Personal insurance

The first four of these sections, firstly identifies if a household had any expenditures associated with that topic, and then if so, the details of the expense are collected. The two topics which are not often featured in many HIES around the world, but have a very significant impact on the economic status of households in the Pacific, are Provision of Financial Support and Contribution to Ceremonies. Provision of Financial Support covers donations the household makes to other households, the church, community or school. These are common in FSM, so need to be accounted for in the survey. Contribution to Ceremonies covers expenses associated with funerals, weddings and birthdays where expenses to the household can also be significant.

## *Module 3: Individual Expenditures*

The second module devoted to collecting expenditure information is the individual expenditure form. As stated above, this form focuses on expenses which can be associated with an individual within the household. There were five such expenditure types identified for the HIES, which included:

1. Pell Grants & Scholarships
2. Education
3. Health
4. Clothing
5. Communication

The first section addressed the income related to scholarship received by all household members during the past 12 months. Sections on education, health and communication focus only on expenditure as the status have been detailed in module1.

#### *Module 4: Income*

The last of the modules covered the collection of income information. This module was divided into eight sections which covered:

1. Wage and Salary
2. Non-subsistence business
3. Agriculture Activities
4. Handicraft and home processed food
5. Livestock activities
6. Fishing activities
7. Property and Transfer income
8. Remittances

In this module, Sections 3–6 all relate to collecting income from subsistence type activities, but due to the importance of this sector to the economy of Pacific Island nations such as FSM, they have been separated out so the importance of each sector can be properly identified.

The other important income aspect for Pacific Island countries which doesn't hold the same importance for other more developed countries is remittances. For this reason a separate section has also been devoted to collecting remittances, which includes the collection of monetary exchanges between households within FSM.

#### *Two 1-week Diaries*

The final forms used for the survey are the two 1-week diaries. These diaries are divided into five sections which cover the following:

- 1) Daily expenditure on food and beverage items
- 2) Other non-food daily expenditures
- 3) Payments for donations and services
- 4) Items received for free
- 5) Home production (consumed, sold, given away)

Section 1 to 3 of the diary refer to cash expenditure made this day (the transaction was done this day), even if the product is not paid this day (shop credit). Any single dollar spent this day is recorded in section 1, 2 or 3.

Section 4 refers to items received for free, food or non-food. Mostly goods are recorded in this section, as they are received as a gift by the household.

Section 5 addresses all subsistence activities the household undertook through all items they home produced this day:

- Food items (vegetables, fruits, crops) harvested or gathered this day
- Fish or sea food caught or collected this day
- Meat from animal killed this day, or eggs collected this day

## 3.4 Data collection strategy

### 3.4.1 Field work timing – entire survey (12 months)

The FSM 2013/14 HIES was conducted over a 12 month period, commencing around the 11<sup>th</sup> July 2013, and concluding on the 10<sup>th</sup> July 2014. In order to spread the survey out over the 12 months, the sample was divided into 16 rounds with roughly 120 households selected in each round.

Each round lasted for approximately 3 weeks, with 2 designated breaks after round 2 and round 7.

Break 1 (after Rd 2): enabled a full review to take place of how field operations went in the first two rounds before field work commences in the third round.

Break 2 (after Rd 7): enabled field staff to take a break during Christmas as it is not an appropriate time to be conducting the field work.

The overall timing of each of the 16 rounds was as follows:

### The 12 month cycle

Round	Dates
Round 1	11 Jul - 31 Jul
Round 2	1 Aug - 21 Aug
Break 1	22 Aug - 4 Sept
Round 3	5 Sept - 25 Sept
Round 4	26 Sept - 16 Oct
Round 5	17 Oct - 6 Nov
Round 6	7 Nov - 27 Nov
Round 7	28 Nov - 18 Dec
Break 2	19 Dec - 2 Jan

Round	Dates
Round 8	3 Jan - 23 Jan
Round 9	24 Jan - 13 Feb
Round 10	14 Feb - 6 Mar
Round 11	7 Mar - 27 Mar
Round 12	28 Mar - 17 Apr
Round 13	18 Apr - 8 May
Round 14	9 May - 29 May
Round 15	30 May - 19 Jun
Round 16	20 Jun - 10 Jul

### 3.4.2 Field work timing – each round (3 weeks)

As discussed above, each round of the survey lasted approximately 3 weeks, with specific tasks being allocated throughout the 3 week period. Of most significance is the diary keeping period which ran for 2 weeks, and fell in the middle of the 3 week period. The diary period was preceded by preparation activities the interviewers need to undertake, and followed by checking procedures to ensure all information collected during fieldwork is complete and correct.

#### The 3 week cycle

DAY #	DAY OF WEEK	Broad Description	Visit #	Description of Activities
Day 1-3	Friday	Preparation activities	1	Identify all households in Workload
	Saturday			Supervisor approves correct hholds identified
	Sunday			Introduce survey to gain hhold co-operation
				Drop of and explain Household Diary # 1
Day 4-5	Monday	Diary keeping period	2	Explain process of visits over next 2 weeks
	Tuesday			Complete front page of Household Envelope
Day 6-7	Wednesday		3	Check on Diary
	Thursday			Complete as much as possible Modules 1-4
Day 8-9	Friday		4	Make an appointment for next visit
	Saturday			Check on Diary
Day 10-11	Sunday		5	Complete as much as possible Modules 1-4
	Monday			Make an appointment for next visit
Day 12-13	Tuesday		6	Check on Diary
	Wednesday			Complete as much as possible Modules 1-4
				Make an appointment for next visit
Day 14-15	Thursday		7	Make sure all Household Diary # 1 are collected
	Friday			Check on Diary
Day 16-17	Saturday		8	Complete as much as possible Modules 1-4
	Sunday			Make an appointment for next visit
Day 18-21	Monday		Checking activities	9
	Tuesday	Check all forms are accounted for		
	Wednesday	Check all forms are filled in correctly		
	Thursday	Ensure all forms are returned to the BoS		
				Thank household for cooperation
				Fill in back page of Envelope

## Roles of Supervisors and Interviewers

The interviewer was the main person responsible for collecting information from each of the households assigned to them each workload. The supervisor was responsible for checking all forms are completed, assisting the interviewer amend any errors, and ensuring everything is returned to the state manager in a correct and timely manner. Supervisor checks must therefore take place in a very thorough manner throughout the entire collection period, **not** at the end of the 3 week cycle.

## 3.5 Data processing

The data for the FSM HIES 2013/2014 was processed using CSPro 6. This processing software was used for data entry, data cleaning, code verification & imputation and finally recode of data. A brief outline of each of these stages of data processing follows:

### 3.5.1 Phase 1: interactive keying

As with all surveys it is always better to correct errors in the field and within the smallest lapse of time between enumeration and processing. The field collection methodology allowed for a two-week enumeration window that gave ample time for survey teams to validate data collected. The data entry process took advantage of this window and allowed for questionnaires to be checked manually as well as systematically using the data entry program.

Standard heads-down data entry practices use double-entry to ensure that data entered in the system truly mirrors information collected on the form. Because of the large amount of survey data collected in the HIES, tight project time frame, and a limited budget, a single-entry interactive system was used in the processing of HIES data. This data entry system aided in improved data quality by incorporating standard error checking specifications listed below.

- System Controlled Entry – The system controlled entry manages the selected sample and the keying of the data following the flow of the questionnaire. This process controlled skip patterns and navigation but allowed the user to force changes to data items if the information captured was not represented in the established set of values.
- Interactive coding – Because the HIES is based on quantitative results, all descriptions must be assigned a code that follows established set of subject specific nomenclatures such as the International Standard Industrial Classification (ISIC). Because the computer does not have the cognitive ability to properly assign codes to these descriptions, the HIES used interactive coding procedures developed uniquely for the standardized HIES which allowed the QDC officer to properly assign codes.
- Validity – This process checked if the data entered in the system fell within established ranges associated with the data item. The process ensured that all the data entered into the system was only valid for that particular question. Again, if the DQC officer deemed the data was a valid response the system allowed DQC officer to force the acceptance of the data into the system but be flagged for future investigation.
- Consistency – This process checked the relation between data items and within acceptable characteristics of the country such as employment, education ages or gender specific expenditures. These cross relations were established before the survey and programmed into the interactive system and checked at the time of data entry.

Error reports were produced by the DQC officer after the entry of at least one module and could be viewed as a print out or as an interactive system correction. The correction of errors was addressed by,

- 1) Checking if the value entered into the system matched to what was written in the questionnaire. If the value wrongly entered then the DQC officer would then make the appropriate change.
- 2) If the data was entered correctly, then the DQC officer would examine if the value in the questionnaire if the value recorded was within the value ranges, followed proper skip patterns or was consistent with previous responses.

A database of errors was created at runtime and updated each time the DQC officer invoked the error checking system. This database allowed the HIES management team to properly assess the progress of the HIES collection team and the quality of the data coming into the office. Proper actions were then initiated if patterns of errors emerged.

### **3.5.2 Phase2: balancing and manual cleaning**

Although a heads-up interactive system was used in the processing of HIES data, data errors are always inevitable. This can be contributed to a multitude of reasons and additional efforts must be made to have accurate data. Data cleaning Phase 1 and Phase 2 was done in-country where access to original questionnaires allowed us to correct data by referencing source documents.

The first step was to ensure that the number of questionnaires recorded into the computer match the number of households that were selected in the frame and that every questionnaire had a proper disposition or response type. The balancing process required the identification of questionnaires that had a non-response or partial response type. Those forms were then manually checked to see if the data entered into the computer matched its actual recorded response type. It is important to determine the minimum amount of information in the questionnaire to ensure that the survey is as accurate of a representation of the population. Thus, trying to improve response rates by determine the minimum level of information for imputation. Those households that were deemed for not having enough information were dropped from the survey and those that contained enough information were flagged for imputation. But part of the activity was preformed after the manual cleaning of information collected in the survey.

Once the balancing activity was completed the manual process of cleaning data items was commenced. This activity was accomplished by

- 1) Producing the error reports for all questionnaires.
- 2) Identify flagged questionnaires and correct errors highlighted in the error reports
- 3) Produce Quality Control tables – these cross variable tables provided additional checks that highlighted outliers in a given set of variables such as age and education where those that are currently enrolled in school are within the established theoretical age range of FSM. Below is the list of tables that were used for quality control.
  - a. Age by Education level (currently in school)
  - b. Age by Education level (no longer in school)
  - c. Age by Activity
  - d. Total cash income
  - e. Total home produced (diary)
  - f. Total home produced (modules)
- 4) Identify flagged questionnaires and correct error highlighted in the QC tables.

Steps were taken to ensure that missing items were not replaced with assumed values from those involved with data corrections. Data items such as these were addressed in Data Cleaning Phase 3.



### 3.5.3 Phase3: code verification and imputation

After appropriate actions were taken to manually correct data, the next step was to ensure that codes assigned to items, industry and occupation descriptions were properly assigned. In order to accomplish this task we converted all description to lower case letters. We then searched double character spaces and converted them to single spaces. By doing this we consolidate like items regardless of case and spacing. Description were grouped into unique descriptors along with its associated code. For example, if “taro” was coded in 30 transactions, all occurrences of “taro” will only appear once in this list. We then assigned the list to be coded for a second time using a standard list of nomenclatures. Each transaction in the database was converted using the same method and the corresponding code originally entered into the system was compared to the second list of descriptors and codes. Any transaction that contained two different codes was then further investigated and properly reassigned.

Dynamic nearest neighbour hot deck imputations were used for only the housing characteristics and demographic profile.

### 3.5.4 Phase 4: recode

The objective of this phase was to combine similar data items in the questionnaire into 6 unique databases. The process involved identifying questions and sections in the questionnaire that were related either by subject area, classifications, and transaction types. The advantages of these databases are listed below:

- Allow for area specific analysis – because the data is organized into similar subject areas, classifications and transaction types, the emerging databases then can be used independently or cross-referenced to other databases.
- Simplify the creation of aggregated data – the overall intention of these sub-databases is to create four main databases used in the analysis of HIES data.
  - 1) Household level record – The household level record contains data items that are repeated only once for every household, such as the characteristics of the dwelling and characteristics of the household head.
  - 2) Person level record – The person level record contains information of the household members such as age, sex and education characteristics.
  - 3) Final Aggregated Income – This record contains all the income streams that a household may receive whether it is cash, in-kind or items. This record also contains intermediate expenditures related to the household’s business or sustainable activity.
  - 4) Final Aggregated Expenditure – Just as the aggregated income, the aggregated expenditure record contains all the items that have been bought throughout the year as well as cash donations, transfers and items that have been produced by the household and consumed.

## SECTION 4 – Quality of results

This section of the report addresses the key issues associated with the quality of the data collected:

- Completeness (%valid questionnaires)
- Data quality - diary
- Data quality – modules

### 4.1 Completeness

Valid households are the one showing completed modules and at least 1 week diary complete.

Table1 - status of questionnaires

	Valid	Not Valid	Expected	% complete
<b>Yap</b>	353	47	400	88.3%
<b>Chuuk</b>	575	144	720	80.0%
<b>Pohnpei</b>	537	103	640	83.9%
<b>Kosrae</b>	199	30	240	86.9%
<b>FSM</b>	1664	324	2000	83.7%

Table1 shows that 83% of the expected questionnaires are complete, with slight differences at the state level. This overall rate is low but the methodology did not allow any replacement in case of refusal, absence of the household member at the time of the interview.

Table2 – status of not valid questionnaires

	Not valid				Not valid	Valid
	out of scope	vacant	absence	refusal		
<b>Yap</b>	0.3%	8.3%	0.0%	3.3%	11.8%	88.3%
<b>Chuuk</b>	6.3%	11.1%	0.1%	2.5%	20.0%	80.0%
<b>Pohnpei</b>	1.1%	12.2%	0.3%	2.5%	16.1%	83.9%
<b>Kosrae</b>	4.8%	7.9%	0.4%	0.0%	13.1%	86.9%
<b>FSM</b>	3.2%	10.5%	0.2%	2.4%	16.3%	83.7%

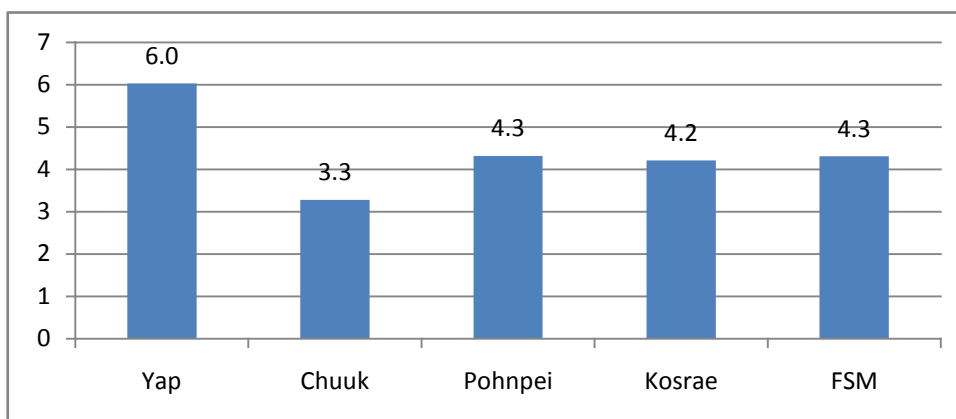
“Vacant house” is the main reason for not proceeding to interview, meaning that 10% of the houses reached were vacant at the time of the survey. Then 3% of the households were “out of scope” (people who stay in FSM or expect to stay for short period less than 6 months).

Chuuk shows the highest rate of not valid (lost) questionnaires with 1 in 5 households lost, mainly due to a high rate of vacant houses and a very high rate of “out of scope”.

## 4.2 Data quality –Items recorded in the diaries

Transactions recorded over the 14 days period in all sections of the diary (food, non-food, services expenditure, free items received and all home production sub sections) from the valid households are eligible to this analysis.

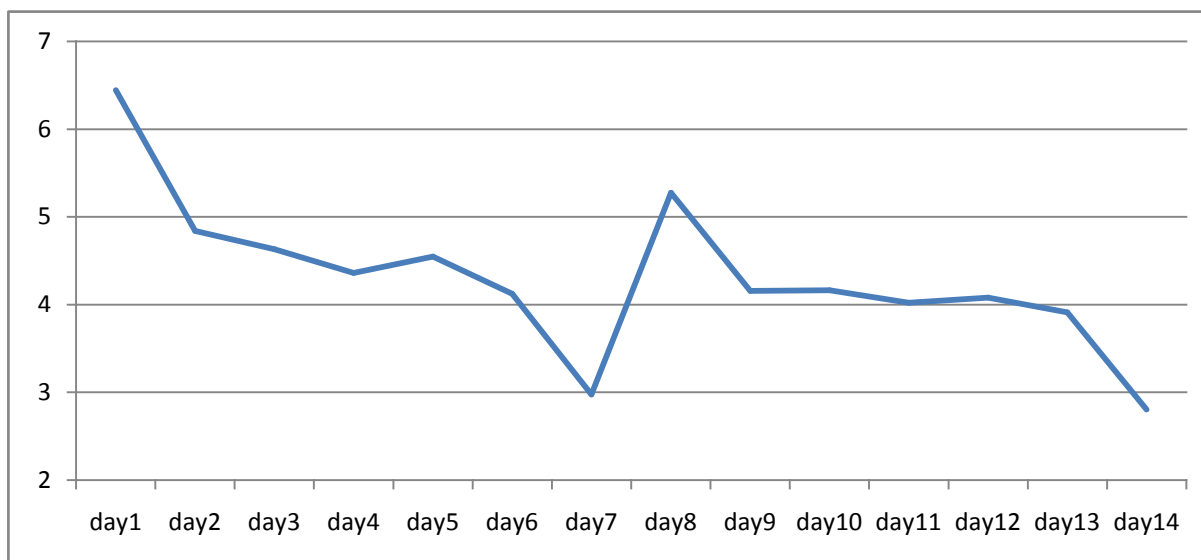
Graph1 – Average number of items reported per day per households / each state



On average 4.3 items per day per households were recorded. Graph1 shows that Yap has reported nearly two times more transactions than the number of transactions reported in Chuuk.

There is no reason to explain this low level of transactions reported in Chuuk apart the lack of supervision and the low number of diary checks done by enumerators during the diary period in this state.

Graph2 – Average items reported per household each day

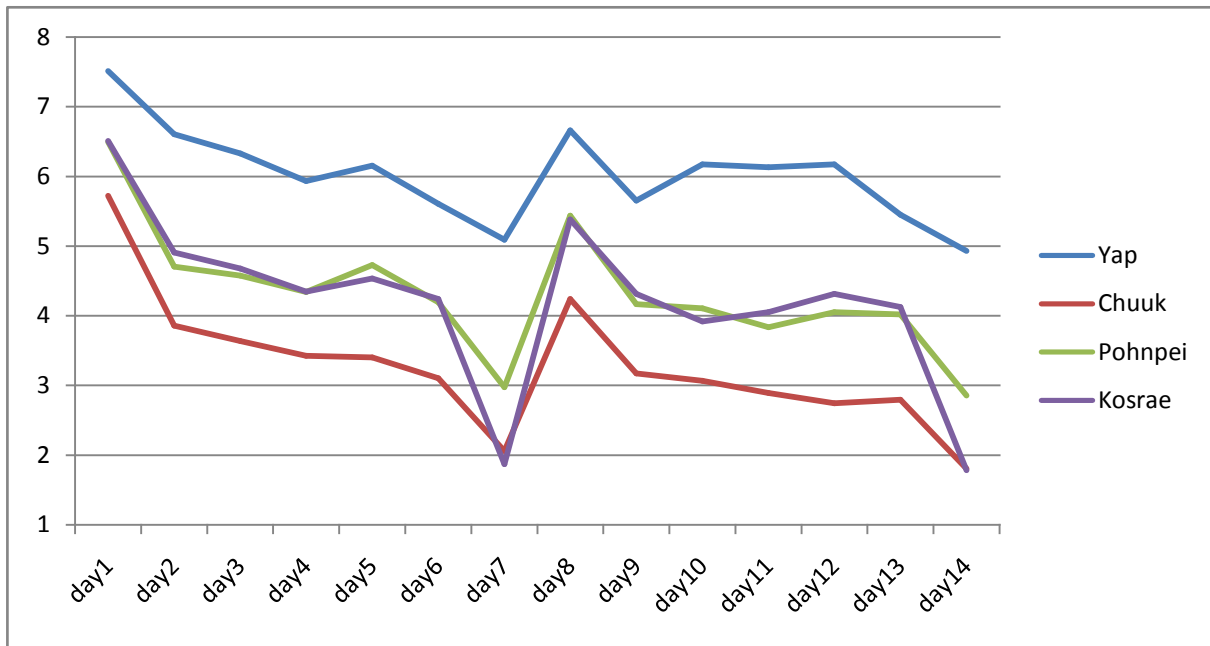


Graph2 presents the traditional trend of items averaged per household over the 2 weeks period. Both weeks show similar profile with a much more items reported the first day then a clear drop over the following 6 days, which is even clearer the last day.

Following the HIES instructions, day1 was supposed to be Monday, meaning that most of the diary started on Monday. Following the trend from graph2 Monday seems to be a shopping day in FSM, then week day show a lower level of shopping, and then week end days.

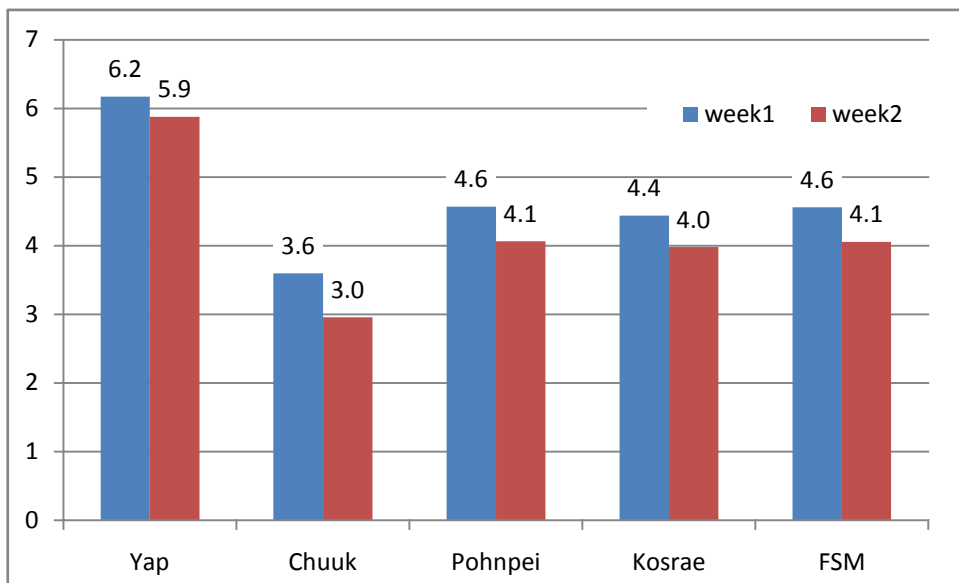
Respondent fatigue and lack of supervision combined explain this trend. Did enumerators visit the household every 2/3 days as expected to check the diary? Graph2 shows that they drop the diary week1 the first day and they came back day8 to pick it and drop diary week2 (pic in day8). The number of visits during the weeks (between day1 and 7 and day8 and 14) seemed to be low.

Graph3 - average number of items per day per household / by state



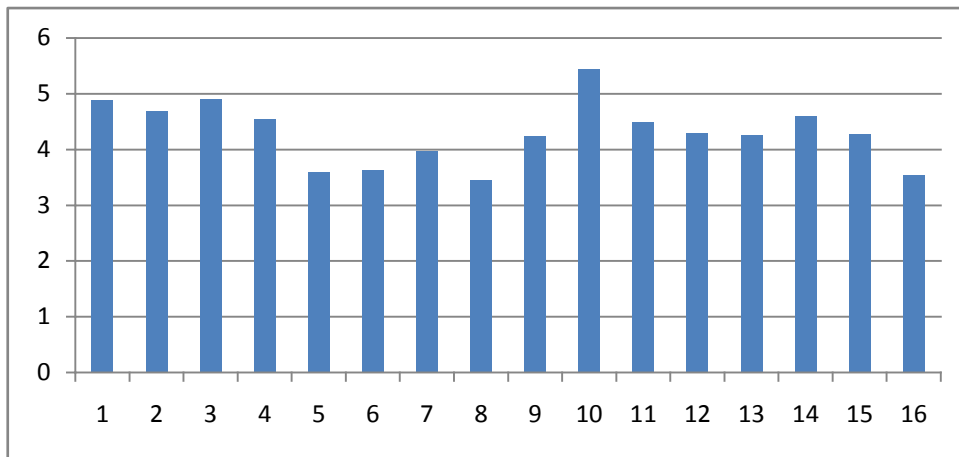
The trend presented in Graph3 is similar in each state and as show in Graph1 Yap has reported a higher number of items each day. Pohnpei and Kosrae show an average level and again Chuuk a low level each day.

Graph4 - Average items reported per households each week



Graph4 summarizes the information show in graph3, just to emphasise the lower number of items reported during week2 with a major difference in Chuuk (fatigue of respondent and low level of supervision of field staff).

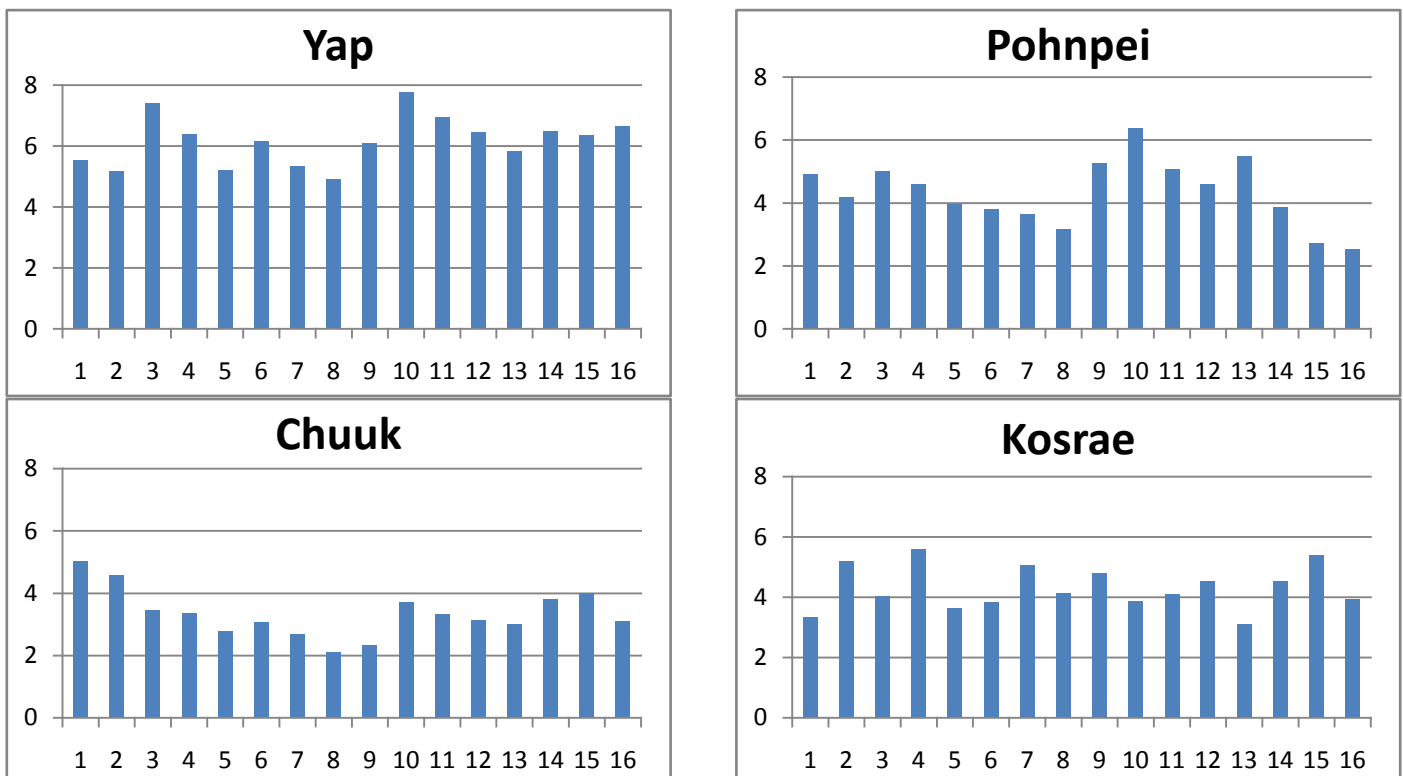
Graph5 – Average number of items per household per day reported in diary / each round



Graph5 shows 2 phases out of the 16 rounds of field operation (12 months period) that correspond to the 2 half of the period (round1 to 8 and 9 to 16). We can see that at the end of the first phase the level of items reported in diary is much lower than at the beginning (from 4.89 items reported in round1 to 3.44 in round8).

At the mid-point of the field operation (round9), each state was told by the HIES management to do a refresher training session on the questionnaire to the field staff. This decision had a positive impact on data quality as graph5 shows better results from round 9/10 to the end.

Graph6 - Average number of items per household per day reported in diary / each round per state



The refresher training had a positive impact in Yap, Pohnpei and Chuuk as show on graph6.

### 4.3 Data quality – Errors showing in the system

Data quality is measured by the number of errors or warnings that was invoked by the data entry system, the number of items that was recorded in the diary and data item outliers.

Before we start to analyse data quality it is important to know how these messages are generated. When a data item is entered into the computer there are no checks done to the data item asides range restrictions and skip patterns and not until the whole module has been entered. The data quality officer then has the option to produce an Error Report. This report contains three important sections.

- 1) Error Messages – These are errors that are unique to the question such as validity (valid ranges) and the linkages between other questions. The messages that are invoked by the system are considered critical and should be corrected.
- 2) Warning Messages – These alerts are valid but can be unlikely. For example a household that has a public water connection but the household did not report any water expenditures was considered a warning because in one of the states in FSM (Kosrae) this event was possible because several areas in Kosrae are provided public water for free.
- 3) Household Expenditure and Income Summary – This section shows (at a glance) the distribution of expenditures in the 12 divisions and the difference between income and expenditure. This allows the DQ officer to quickly identify errors in the diary and modules.

One of the easiest indicators of data quality is the frequency of errors and warnings. Table3 shows the number of errors/warnings reported by the system at the end of the field operation.

Table3: number of errors/warnings still showing at the end of the field operation (July 2014)

	Responding households	Number of errors	error to HH ratio	Number of warnings	warning to HH ratio	Grand Total	total alerts to HH ratio
<b>Yap</b>	353	25	0.1	432	1.2	457	1.3
<b>Chuuk</b>	575	2448	4.3	444	0.8	2892	5.0
<b>Pohnpei</b>	537	137	0.3	382	0.7	519	1.0
<b>Kosrae</b>	199	241	1.2	605	3.0	846	4.2
<b>TOTAL</b>	1664	2851	1.7	1863	1.1	4714	2.8

On average 2.8 error messages were still showing at the end of the field operation. If we refer only to the error message, 1.7 errors were reported on average per questionnaire. Chuuk shows a very high number of error messages, with more than 4 errors per questionnaire. This high number of error in this state proves the bad quality of the data collected and the lack of supervision. At a lower level, Kosrae seems to be a bit high with still more than 1 error. In Yap and Pohnpei the data quality is good, with a very low number of errors.

#### 4.4 Data quality – Most common error messages

With only 0.1 errors per questionnaire Yap shows the best result in terms of data quality. Only 25 errors were still showing at the end of the field operation. Table 3 presents the top errors detected in Yap and the frequency

Table 3 – Top errors in Yap

Frequency	Error
25	1030611 E -(M1P5) [HM](%D) is either too young or too old [AGE=%d] to be the indicated grade level [GRADE=%d], please correct.  Note – This error is triggered if the reported age is above or below the theoretical education enrolment age of the country.

Table3 shows that all the error messages that were still showing in Yap at the end of the field operation were the same (25 in total). It means this message came out 25 times and it refers to a discrepancy related to the grade/level of school and the age of the household member (according to the age declared in demographic section 1.1 the grade declared for those who are still attending school is impossible). This error is due to a bad reporting of enumerator.

Out of the 137 errors that showed up in Pohnpei, Table4 shows the most common ones.

Table4 – Top errors in Pohnpei

Frequency	Error
21	1030611 E -(M1P5) [HM](%D) is either too young or too old [AGE=%d] to be the indicated grade level [GRADE=%d], please correct.  Note – This error is triggered if the reported age is above or below the theoretical education enrolment age of the country.
4	5110452 E -Day:%d, %s, Line:%d, %s contains an invalid COICOP code. Please correct Description: %s  Note – This error is triggered if the COICOP number entered into the system does not have a corresponding match in the COICOP database
2	1010505 E -(M1P1) The day entered for [HM](%D) is not valid for the corresponding month. Please correct.  Note – This error is triggered if the day entered for a particular month is out of bounds. E.g., February 30, 2013

The most common error in Pohnpei was the same as the one showing in Yap (inconsistent current level of school according to the age of the household member) which came out 21 times (15% of the errors in Pohnpei). Then 4 wrong COICOP codes in diary were detected by the system, which might come from typing error from data entry operators. The last error message

that came out 2 times only refers to inconsistent date of birth, and might come from typing error as well.

As shown in the previous section, the quality is not as good in Kosrae. Table5 presents the most common errors that were still popping up in this state at the end of the field operation.

Table5 – Top errors in Kosrae

Frequency	Error
92	1030611 E -(M1P5) [HM](%D) is either too young or too old [AGE=%d] to be the indicated grade level [GRADE=%d], please correct.  Note – This error is triggered if the reported age is above or below the theoretical education enrolment age of the country.
53	5110451 E -Day:%d, %s, Line:%d, %s is COICOP coded as 999999999 which is the code for missing. Please verify. Description: %s.  Note - This error is triggered when the DQ officer made sufficient attempts to code a commodity but could not locate a proper COICOP code and a place holder COICOP was used instead.
20	4011003 E -(M4P2) Total wages & salaries for [HM] (%D) is incorrect. The Entered Valued is %D. The Calculated Value is %D. Please correct.  Note – This error is triggered when the total amount reported does not sum to the list of wages reported in the income section.

241 errors in total were detected in Kosrae, among those 92 were still referring to the same discrepancy between age and current level of education. The second most common error in Kosrae was the missing COICOP code. When the data entry operator did not know how to code some items, they just entered “99999999”. This code was supposed to be a temporary code as the item had to be reported to HIES management in order to get the proper code and correct it. The third most common message in Kosrae came from the wage section in module4, where the sum of all wages did not match with the sum reported at the bottom of the section. This means that some typing errors were detected in the amount of wages.

As presented before, Chuuk shows some very bad performance indicators in terms of data quality.



Table6 – Top errors in Chuuk

Frequency	Error
1358	5110652 E -Day:%d, %s, Line:%d, %s contains an invalid number for QUANTITY. Valid numbers are 0:800.0 or 999.9 for missing. Please correct.  Note – This error is triggered when the data item is left blank or zero. This is common because the item was not properly filled in for items that contain only a single item. E.g., 1 10KG bag of rice, where the 1 was assumed. This could be reported as a false error.
103	4011003 E -(M4P2) Total wages & salaries for [HM] (%D) is incorrect. The Entered Valued is %D. The Calculated Value is %D. Please correct.  Note – This error is triggered when the total amount reported does not sum to the list of wages reported in the income section.
58	4070301 E -(M4P13) %S must contain a valid value of 1(Yes) or 2(No). Please correct. Note – This error is triggered when the section “Ownership of a business” is left blank. During data editing this item, if left blank, was assumed to be a non-business owner.

55% of the errors in Chuuk came from the diary where quantities were missing for food items (which was a strong requirement). The second most common error in Chuuk was the typing error detected in the wages section (same as Kosrae) and the third one came from the own business question that was left blank (non response) in 58 cases.