Online Diaries for Everyone: Data Quality, Device Usage and Compliance with Personal Expenditure Diaries

Douglas Williams, Westat
Hanyu Sun, Westat

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Outline

- Background & Online Diary Improvement Project
- Usability test design and methods
- Findings: compliance
- Findings: diary and device usage
- Findings: data quality
- Summary

Background

- CE Diary one of two components of the CE Survey capturing minor and frequent expenditures.
- Current diary uses PAPI and a household respondent covering two one-week reporting periods.
- Continued review and development of online platform for CE Diary (see Elkin, To, and Williams, 2017 – FedCASIC).
  - Web Diary Feasibility Test – 2013
  - Individual Diaries Feasibility Test (IDFT) – 2014
  - Proof of Concept Test – 2015
  - Electronic Diary Desktop Design Improvements – 2016

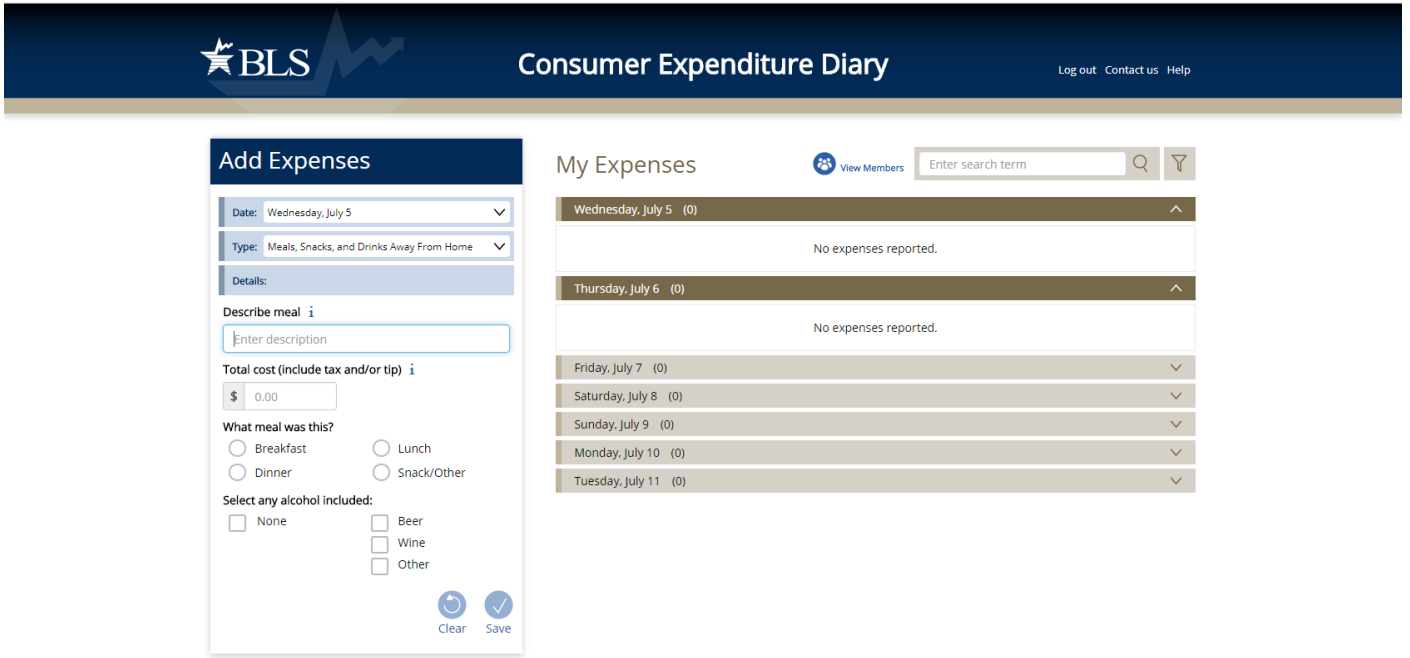
Online Diary Improvement Project

- Developed collaboratively with BLS building on prior research and diary data requirements
  - Modernization – flexible instrument that can add and adapt to new technologies
  - Accessible across multiple platforms and mobile optimized
    - Smartphone ownership: 55% in 2013; 77% in 2016
  - Designed for personal diary assignment
- Instrument developed using open-source programming software
  - Adaptive (web) design – optimized for mobile
  - Design elements (look and feel) same across device types used to access

Design & Methods:
Online Diary Improvement Project

- Recruited households for usability test
  - Desktop/Laptop and Smartphone ownership
  - Multiple age eligible household members (71% of households)
- Procedure: placement interview; diary reporting; pick-up interview
  - In-person interviews conducted March, 2017 – May, 2017
  - Completed 62 placement interviews; 61 pick-up interviews
  - Incentive: $40 for the main diarist; $10 for other HHM

Desktop Diary View



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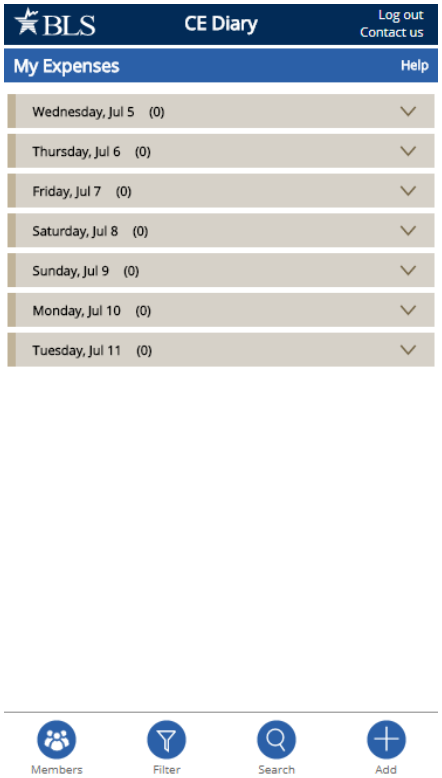
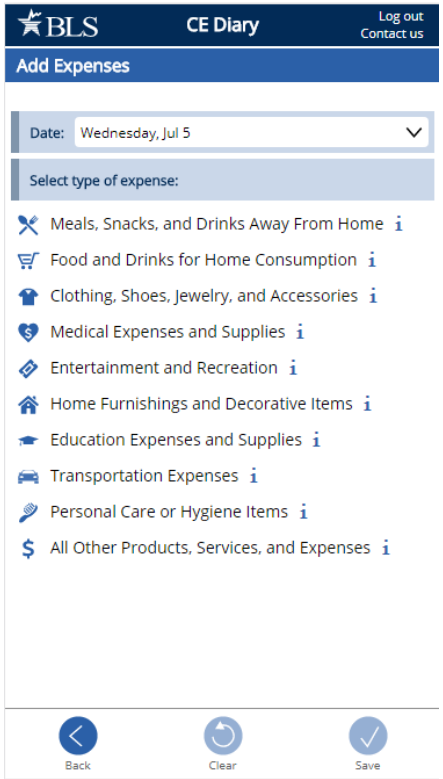
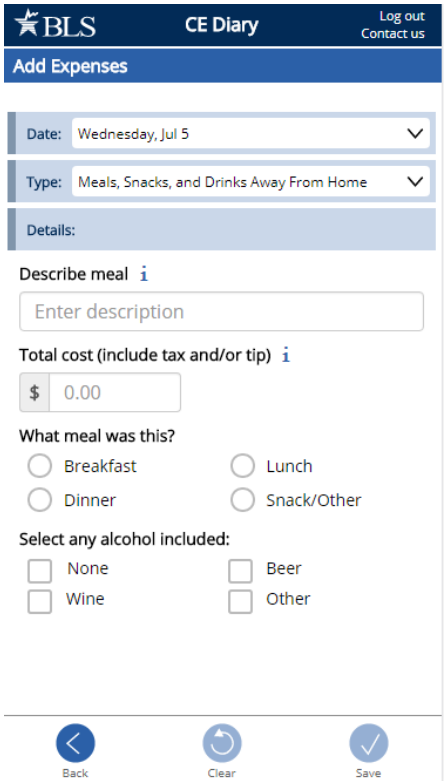
Mobile Diary View







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Usability Test Results

Research Questions

- Compliance & Use
  - How well do different household members comply with the diary task?
- Device Usage
  - What are the characteristics diary usage by device?
  - Are there differences in types of expenditures entered by device type?
  - Are there any barriers to accessing the online diary?
- Data Quality
  - Do expenditure descriptions indicate problems or category mismatches?

Compliance

- How well do different household members comply with the diary task?
  - Composition of recruited sample
    - 62 main diarist – responsible for encouraging other HHM participation
    - 72 other household members
- Access & Use
  - Access: log-in and create password
  - Use: enter any expense

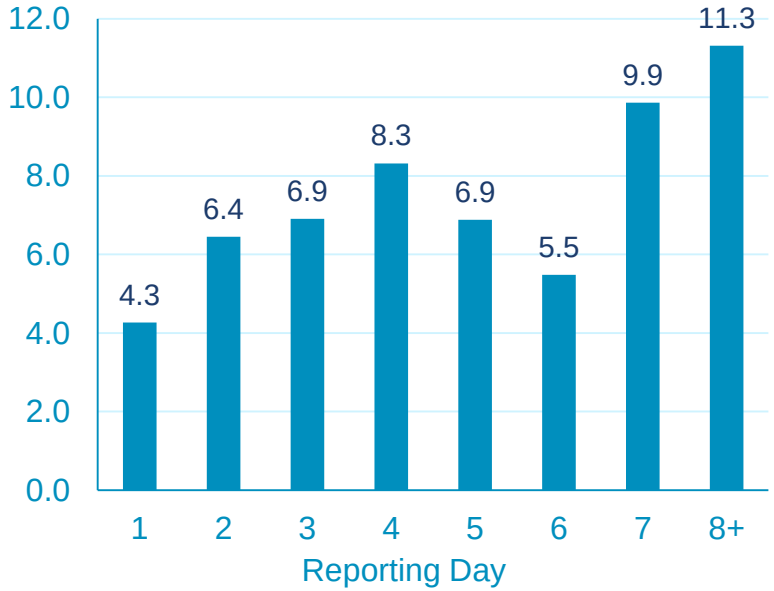
Compliance: Results

- Access & Use
  - 61 of 62 (98%) main diarist accessed the diary
  - 50 of 72 (69%) other household members accessed the diary
  - Similar results for use
- Comply with directions to access and change password day of visit

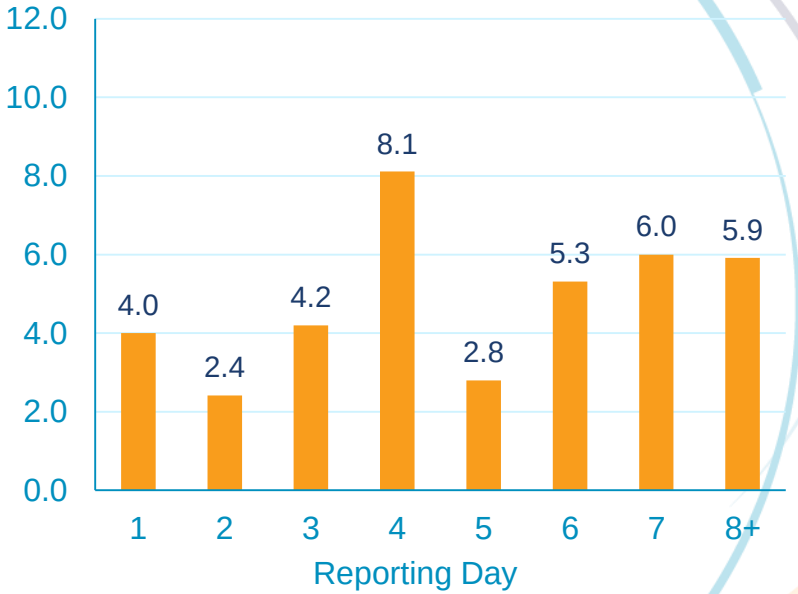
Days from visit	0	1	2	3	4	5	6	7+
Main Diarist	51%	16%	8%	7%	5%	5%	2%	7%
Other	22%	18%	10%	10%	6%	14%	14%	6%

Expense Reporting Behavior

Main Diarist



Other Household Members



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Expense Entry Timeliness

- Timely entry of expenses
  - Suggest attentiveness to the diary task
  - Better data: less time for recall; less likely to forget expense

Difference	0	1	2	3	4	5	6+
Main Diarist	31.0	33.2	11.3	11.2	4.6	2.5	6.2
Other	15.1	36.4	9.0	9.2	9.0	6.7	14.6
All	27.0	34.0	10.7	10.7	5.7	3.6	8.3

Device Usage: Characteristics

- What are the characteristics of diary usage by device?
  - Half of main diarist used mobile / one-third only used mobile

Device Type	Desk / Laptop	Mobile	Both
Main Diarist (n = 61)	43	31	13
Other (n = 49)	37	20	7

  - Why not more mobile: smaller screen, lack of tactile keyboard
  - Desk/Laptop used more (1,522; 679), mobile entries were more timely

Difference	0	1	2	3	4
Desk/Laptop	24%	31%	12%	12%	21%
Mobile	33%	41%	8%	8%	10%

Device Usage: Expense Types

- Are there differences in types of expenditures entered by device type?
  - ODIP – CE expense categories expanded from 4 to 10

- Food and Drinks Away from Home
- Food and Drinks for Home Consumption
- Clothing, Shoes, Jewelry, and Accessories
- All Other Products and Services

- Meals, Snacks, and Drinks Away From Home
- Food and Drinks for Home Consumption
- Clothing, Shoes, Jewelry, and Accessories
- Medical Expenses and Supplies
- Entertainment and Recreation
- Home Furnishings and Decorative Items
- Education Expenses and Supplies
- Transportation Expenses
- Personal Care or Hygiene Items
- All Other Products, Services, and Expenses

Table: Expense Type by Device Type

Expense Type	Desk/Laptop	Mobile	All
1 - Meals, Snacks, and Drinks Away From Home	15.0%	30.2%	19.7%
2 - Food and Drinks For Home Consumption	52.9	21.5	43.2
3 - Clothing, Shoes, Jewelry, and Accessories	6.0	6.8	6.2
4 - Medical Expenses and Supplies	1.9	2.4	2.0
5 - Entertainment and Recreation	2.1	5.7	3.2
6 - Home Furnishings and Decorative Items	0.3	2.5	1.0
7 - Education Expenses and Supplies	0.4	0.7	0.5
8 - Transportation Expenses	6.6	9.7	7.6
9 - Personal Care, or Hygiene Items	3.7	8.0	5.0
10 - All Other Products, Services, and Expenses	11.1	12.5	11.5

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Barriers to Access: Failed Login Attempts

- Are there any barriers to accessing the online diary?
  - Setting/remembering password most reported barrier
  - Password
    - Eight characters: number, upper & lower-case letter, special character (!@#$%^&*)

Total number of failed attempts	0	1	2	3	4	5	6	7+
Percent	46.9	12.6	8.1	3.6	3.6	3.6	4.5	17.1

    - One-half of all failed attempts occurred before setting password

Data Quality

- Do expenditure descriptions indicate problems or category mismatches?
  - Description field: open-ended text field for describing expense
    - Red polo shirt; 2 liter coke; Bananas; Gasoline; Etc…
  - Type of issues identified – independent coding and review
    - Including multiple items in one entry
    - Vague descriptions: item or expense is unclear (e.g., food, clothes, cleaning)
    - Establishment name: (e.g., restaurant name)
    - Incorrect category
    - Unidentifiable: gibberish

Data Quality: Expense Description

- Overall, poor quality descriptions low (of n = 2,255 total expenses)
- Issues clustered within respondents, or affect specific category
  - 14 respondents account for over half (55%) of coded issues
  - Establishment name generally used for meals away from home (restaurant name)

Description Issue Type	Count	Percent/All Expenses
Multiple items	52	2.3%
Vague description	37	1.6%
Establishment name	59	2.6%
Incorrect category	41	1.8%
Unidentifiable	13	0.6%

Summary

Summary

- Personal Diaries
  - Near uniform use of online diary by main diarist (household respondent)
    - Usage lower for other HHM, but encouraging
    - Minimum level? Estimate the proportion of expenses lost for household diaries versus loss due to nonparticipation in personal diaries.
    - Not ideal to rely on the main diarist to encourage and motivate other HHM to participate
    - Indications that other HHM start later and abandon sooner

Summary

- Online Diaries
  - Offer dimensions not available with paper: use of multiple devices, mobility
  - Mobile devices were frequently used, but not as expected
    - Most respondents used at home – still convenient
    - Receipt complexity influencing device type used?
  - Expenses entered via mobile device were more timely – better data?
  - Password the biggest barrier to access – and mobility
  - Data quality – low incidence of issues, but still problematic
    - E.g., 52 instances of multiple entries can equal 100-150 missed expenses

Thank you!

DouglasWilliams@Westat.com