Marketplace Income Verification and the Affordable Care Act

By

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The views expressed within this manuscript are attributed to Jacqueline Roche and not the Centers for Medicare and Medicaid Services.

Marketplace Income Verification and the Affordable Care Act *Abstract*

Objectives: Significant new health reforms were enacted in 2010 with the passage of the Affordable Care Act "the ACA" with the goal of providing near-universal access to affordable health coverage for consumers. The ACA established the new health insurance "Marketplaces" for consumers to shop for and purchase health insurance as well as to receive an eligibility determination for subsidies in the form of the advance payment of the premium tax credit (APTC) and cost sharing reductions (CSRs). States which chose not to operate their own state based Marketplace (SBMs) defaulted to the federally run option and consumers in such states applied through the federally facilitated Marketplace (FFM), also referred to as HealthCare.gov states. HealthCare.gov and the inaugural open enrollment period launched on October 1, 2010 and despite early challenges, the collective ACA reforms have resulted in nearly 17 million Americans gaining access to affordable health care. With the third open enrollment period well under way the Marketplace is incentivized to pursue program and policy improvements aimed at maximizing enrollment, improving eligibility verification and accurate eligibility determinations and maintaining consumer eligibility for subsidies.

A key component of these priority areas is improving both the program implementation and the consumer experience related to eligibility verification for subsidies. Obtaining improved information about consumers experiencing income verification issues (also referred to as "data matching issues (DMIs)" during the application process is a must if the Marketplace is to successfully provide the correct subsidies and ultimately maximize enrollment numbers. The stakes are particularly high as consumers who fail to resolve such income DMIs are at risk of losing all or part of their Marketplace subsidies, and may ultimately lose coverage. Improved targeted interventions such as outreach and education campaigns aimed at resolving application data issues and preserving coverage levels are required. Moreover, improved data collection efforts are essential for ongoing program evaluation as well as for purposes of

program integrity measures and resource allocation, in a resource limited program. Therefore, the aim of this study is to develop an improved data strategy in order to learn more about the impacted population as well as to develop modernized and data driven strategies to maximize eligibility verification and enrollment.

Methods: The methodological approach is established in the two phases of the Marketplace Income Verification Data Analysis Framework. Phase 1 (Descriptive Statistics) establishes for the first time a verified data set of Marketplace consumers impacted by income verification and includes the data collection and analysis of demographic variables, DMI activity by region and by available Marketplace Assistor Programs for 2015. Phase 2 (Cluster Analysis and Predictive Modeling) employs a data mining technique referred to as cluster analysis to determine if meaningful sub groups can be identified within the baseline data to learn more about the consumer profiles of impacted consumers and to build a predictive model used to identify additional "high risk" consumers in the future. A predictive model with the ability to successfully identify the highest risk consumers will immediately allow the Marketplace program to add additional needed resources, such as coordinated call centers and advanced resolution centers, and more highly skilled eligibility workers on those consumer cases that fit the risk profile in order to more expeditiously resolve the data matching issues and maintain coverage.

Results: The results of Phase 1 offer new baseline data on policy relevant descriptive statistics, including demographic variables, geographic patterns and resource allocation relevant for the Marketplace consumers impacted by income data matching. The results of Phase 2 (the cluster analysis) first demonstrate the methodology was successful in meaningfully organizing a large data set of consumers with eligibility verification issues and secondly is able to identify five clusters (clusters 1, 4, 5, 7 and 9) identified as the most "high risk" consumers, likely to have significant issues with income verification. Finally, a predictive model is successfully built to identify the consumer profiles of future "high risk" consumers, likely to experience issues with income verification in future open enrollments.

Conclusions: The results of this study identify the segments of Marketplace consumers most at risk for losing APTC/CSRs for failure to resolve their income DMIs. The findings represent the first available detailed descriptive data and the first attempt to apply cluster segmentation techniques to Marketplace consumers. This project should be a starting point for additional research and analysis to identify consumers struggling with income verification. Specific recommendations include the establishment of an eight-part Strategic Data Plan aimed at expanding the data on the impacts of the income verification process and a Pilot project to provide consumers identified as "high risk" with targeted intervention, specifically in the areas of outreach and education.

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Table of Contents

Marketplace Definitions and Acronyms:

Advance Payments of the Premium Tax Credit (APTC): The Affordable Care Act provides a new tax credit to help consumers afford health coverage purchased through the Marketplace. Advance payments of the tax credit can be used right away to lower monthly premium costs. If a person qualifies, he or she may choose how much advance credit payments to apply to premiums each month, up to a maximum amount. If the amount of advance credit payments received for the year is less than the tax credit due, the consumer or household will receive the difference as a refundable credit when the federal income tax return is filed. If the advance payments for the year are more than the amount that has been received in credit, the excess advance payments must be repaid during the tax filing process.

Affordability: Annual premium for the lowest-cost option of employer-sponsored self-only coverage that provides minimum value and does not exceed 9.5 percent of household income.

Affordable Care Act (ACA): The comprehensive health care reform law enacted in March 2010. The law was enacted in two parts: The Patient Protection and Affordable Care Act was signed into law on March 23, 2010 and was amended by the Health Care and Education Reconciliation Act on March 30, 2010. The name "Affordable Care Act" is used to refer to the final, amended version of the law.

Applicant: A person that makes a formal application for the Marketplace.

Attest/Attestation: When a consumer applies for health coverage through the Marketplace, they are required to agree (or "attest") to the truth of the information provided by signing the application.

Benefits: The health care items or services covered under a health insurance plan. Covered benefits and excluded services are defined in the health insurance plan's coverage documents. In Medicaid or CHIP, covered benefits and excluded services are defined in state program rules.

Benefit Year: A year of benefits coverage under an applicant health insurance plan. The benefit year for plans bought inside or outside the Marketplace begins January 1st of each year and ends December 31st of the same year. Your coverage ends December 31st even if your coverage started after January 1st. Any changes to benefits or rates to a health insurance plan are made at the beginning of the calendar year.

Co-payment: A fixed amount (for example, $15) that a consumer pays for a covered health care service, usually when they receive the service. The amount can vary by the type of covered health care service.

Cost Sharing Reduction (CSR): A discount that lowers the amount a person has to pay out-of-pocket for deductibles, coinsurance, and copayments. Consumers may receive this reduction if they get health insurance through the Marketplace, their income is below a certain level, and they choose a health plan from the Silver plan category. If a consumer is a member of a federally-recognized tribe, they may qualify for additional cost-sharing benefits.

Deductible: The amount the consumer owes for health care services that their health insurance or plan covers before their health insurance or plan begins to pay. For example, if the consumer's deductible is $1000, their plan will not pay anything until they have met their $1000 deductible for covered health care services subject to the deductible. The deductible may not apply to all services.

Dependent: A child or other applicant for whom a parent, relative, or other person may claim a personal exemption tax deduction. Under the Affordable Care Act, applicants may be able to claim a premium tax credit to help cover the cost of coverage for themselves and their dependents.

DHS Systematic Alien Verification for Entitlements: The Verification Division of the United States Citizenship and Immigration Services (USCIS) administers the Systematic Alien Verification for Entitlements (SAVE) Program. SAVE is a fee-based intergovernmental initiative designed to help federal, state, tribal, and local government agencies check immigration status for granting benefits, licenses, and other lawful purposes.

Essential Health Benefits: A set of health care service categories that must be covered by certain plans, starting in 2014.

The Affordable Care Act ensures health plans offered in the applicant and small group markets, both inside and outside of the Health Insurance Marketplace, offer a comprehensive package of items and services, known as essential health benefits. Essential health benefits must include items and services within at least the following 10 categories: ambulatory patient services; emergency services; hospitalization; maternity and newborn care; mental health and substance use disorder services, including behavioral health treatment; prescription drugs; rehabilitative and habilitative services and devices; laboratory services; preventive and wellness services and chronic disease management; and pediatric services, including oral and vision care.

Insurance policies must cover these benefits in order to be certified and offered in the Health Insurance Marketplace. States expanding their Medicaid programs must provide these benefits to people newly eligible for Medicaid.

Eligibility Assessment: In certain states, the Marketplace doesn't provide the final decision on Medicaid eligibility. Instead, the Marketplace conducts an assessment and passes the application to the State Medicaid Agency to conduct a final eligibility determination.

Employer Shared Responsibility Payment: The Affordable Care Act requires certain employers with at least 50 full-time employees (or equivalents) to offer health insurance coverage to its full-time employees (and their dependents) that meets certain minimum standards set by the Affordable Care Act or to make a tax payment called the ESRP.

Exemption from the Shared Responsibility Payment: Applicants that do not have health coverage starting in 2014 may have to pay a fee.

Federally-facilitated Marketplace (FFM): The FFM operates in states that have chosen not to build their own Marketplace. The Marketplace developed by CMS will be easily adapted to meet the needs of any state that chooses to utilize this model on a temporary or permanent basis.

Federally-Recognized Tribe: Any Indian or Alaska Native tribe, band, nation, pueblo, village or community that the Department of the Interior acknowledges to exist as an Indian tribe.

Federal Poverty Level (FPL): A measure of income level issued annually by the Department of Health and Human Services. Federal poverty levels are used to determine your eligibility for certain programs and benefits.

Federal Tax Information (FTI): It includes, but is not limited to:

- Any information, besides the return itself, that IRS obtained from any source or developed through any means that relates to the potential liability of any person under the Code for any tax, penalty, interest, fine, forfeiture, or other imposition or offense.
- Information extracted from a return, including names of dependents, or the location of business.
- The taxpayer's name, address and identification number.
- Information collected by the IRS about any person's tax affairs, even if identifiers like name, address and identification number are deleted.
- Whether a return was filed, is or will be examined or subject to other investigation or processing, including collection activities.
- Information contained on transcripts of accounts

Health Insurance: A contract that requires a consumer's health issuer to pay some or all of the consumer's health care costs in exchange for a premium.

Health Insurance Marketplace (Marketplace): A resource where applicants, families, and small businesses can: learn about their health coverage options; compare health insurance plans based on costs, benefits, and other important features; choose a plan; and enroll in coverage. The Marketplace also provides information on programs that help people with low to moderate income and resources pay for coverage. This includes ways to save on the monthly premiums and out-of-pocket costs of coverage available through the Marketplace, and information about other programs, including Medicaid and the Children's Health Insurance Program (CHIP).

Household Income for the Premium Tax Credit: Primary taxpayer's MAGI, plus every other applicant who is claimed as an exemption and who is required to file a federal tax return.

Inconsistency Period or Data Matching Issue (DMI): When the Marketplace cannot verify information needed to determine eligibility using the trusted data source a data matching issue (DMI) and an inconsistency period may be triggered.

Individual Market The market for health insurance coverage offered to applicants other than in connection with a group health plan.

Individual Shared Responsibility Provision: Each applicant is required to have basic health insurance coverage or minimal essential coverage (MEC), qualify for an exemption, or make a shared responsibility payment when filing a federal income tax return. Applicants will not have to make a payment if coverage is unaffordable, if they spend less than three consecutive months without coverage, or if they qualify for an exemption for several other reasons, including hardship and religious beliefs.

Minimum Value: A health plan meets this standard if it's designed to pay at least 60% of the total cost of medical services for a standard population. Applicants offered employer-sponsored coverage that provides minimum value and that is affordable won't be eligible for a premium tax credit.

Medicaid: A state-administered health insurance program for low-income families and children, pregnant women, the elderly, people with disabilities, and in some states, other adults. The federal government provides a portion of the funding for Medicaid and sets guidelines for the program. States also have choices in how they design their program, so Medicaid varies state by state.

Modified Adjusted Gross Income (MAGI): The figure used to determine eligibility for lower costs in the Marketplace and for Medicaid and CHIP. Generally, modified adjusted gross income is the adjusted gross income plus any tax-exempt Social Security, interest, or foreign income a person has.

Minimum Essential Coverage (MEC): The type of coverage an applicant needs to have to meet the applicant responsibility requirement under the Affordable Care Act. This includes applicant market policies, job-based coverage, Medicare, Medicaid, CHIP, TRICARE and certain other coverage.

Notice: An official form of communication that informs applicants about the status of their applications, their eligibility for programs, or other important information. Notices may be sent by the Marketplace or by health issuers.

Plan: A benefit that an applicant's employer, union or other group sponsor provides to them to pay for their health care services.

Plan Management: Encompasses a broad range of functions, including certifying qualified health plans (QHPs), collecting and reviewing rate and benefit information, managing contracts with QHPs, monitoring ongoing compliance issues, recertifying and decertifying QHPs, and running an open enrollment process.

Premium: The amount that must be paid for a consumer's health insurance or plan. The consumer and/or their employer usually pay it monthly, quarterly or yearly.

Presumptive Eligibility: Presumptive eligibility gives uninsured people immediate, temporary Medicaid if they appear to be eligible based on income.

Product: A product is differentiated by covered benefits (e.g., a PPO v. HMO will be different products). A plan is a representation of a product at a certain cost sharing level for a particular service area.

Provider: A physician (M.D. – Medical Doctor or D.O. – Doctor of Osteopathic Medicine), health care professional or health care facility licensed, certified or accredited as required by state law.

Qualified Health Plan (QHP): Under the Affordable Care Act an insurance plan that is certified by the Health Insurance Marketplace, provides essential health benefits, follows established limits on cost-sharing (like deductibles, copayments, and out-of-pocket maximum amounts), and meets other requirements. A qualified health plan will have a certification by each Marketplace in which it is sold.

Qualifying Life Event: A change in your life that can make you eligible for a Special Enrollment Period (SEP) to enroll in health coverage. Examples of qualifying life events are moving to a new state, certain changes in your income, and changes in your family size (for example, if you marry, divorce, or have a baby).

State-based Marketplace (SBM): A state implementing and operating its own Marketplace.

State Partnership Marketplace (SPM): A Marketplace in which the states are responsible for the administration of the plan management and/or consumer activity functions while the federal government performs all other functions of the Marketplace, including eligibility and enrollment functions.

Tax Household: The taxpayer(s) and any applicants who are claimed as dependents on one federal income tax return. A tax household may include a spouse and/or dependents.

Chapter 1: Marketplace Income Verification and the Affordable Care Act: *Introduction*

The passage of the Affordable Care Act "the ACA" in 2010 represents the most significant progress toward health coverage expansion for the uninsured in decades. The establishment of new "Marketplaces" and HealthCare.gov for consumers to shop for and purchase health insurance as well as to receive an eligibility determination for subsidies in the form of the advance payment of the premium tax credit (APTC) and cost sharing reductions (CSRs) is a fundamental cornerstone of the new law and in combination with the efforts of states choosing to both expand Medicaid and establish their own state based Marketplaces has led to the enrollment of nearly 18 million people since the launch of the new Marketplaces in October of 2010.

The Federal Marketplace is only in the third year of operations and there are significant opportunities to learn more about the consumers served by the emerging Marketplace and the challenges faced in navigating the eligibility and enrollment process. The eligibility verification process is one of the most complex features of this new program, and income verification has proven particularly challenging for both consumers and the Marketplace. In plan year 2015, nearly four million households who applied for premium assistance in the Federal Marketplace were identified as having an annual income DMI. Approximately 1.4 million consumers lost either part or all of their APTC and in certain cases also the benefits of CSRs, the remaining consumers were resolved or updated their applications.[i] The loss of APTC, particularly when all APTC is lost, is correlated with subsequent health plan termination as the consumer household usually fails to pay the full price of coverage once the premium assistance is unavailable.[1] Enrolled consumers have the option to return to the Marketplace and update their projected household income and regain APTC based on this updated projection, however this a confusing process and the Marketplace is inevitably losing enrollments at this

[1] For individuals receiving APTC issuers are required to provide enrollees a 3-month grace period, 45 CFR 155.436 and 156.270

juncture. Eligible consumers who have lost APTC for which they are eligible will recoup their premium tax credit during tax reconciliation once they file their taxes with the IRS; however the consumer has already lost all the advantages of the upfront financial assistance to pay monthly premiums. Importantly, there is no available evidence suggesting consumers are deliberately misrepresenting their attested household income in order to qualify for additional APTC, instead the evidence points to consumer confusion with both the complicated application process and the associated data verification process that presents unique challenges for consumers to navigate.

The Marketplace is in the early stages of development and while over 2 million income issues were resolved last year, the high percentage of households not successfully verified highlights the challenges many consumers continue to experience with income verification. Early feedback from consumers and advocacy groups has suggested several main causes of this confusion. First, the Marketplace outreach and communication strategy is lacking and the consumer notices, outbound calls and emails are too cumbersome and not appropriately targeted. The notices also lack sufficient information to inform consumers how to resolve their DMIs. Second, the Marketplace lacks adequate resources to help consumers navigate the resolution process. Third, the income verification process is nearly impossible for consumers with non-traditional employment and income sources which make it hard to estimate the accurate amount of projected household income and to further support these attestations with proper income documentation. Fourth, income volatility, or income instability, is significant for the consumers served by the Marketplace which also underscores the challenges of both attempting to estimate projected household income and following up with appropriate documentation required by the current verification process when household income is chronically in flux.

The Marketplace received thousands of complaints from consumers struggling with the income verification process who are seeking additional help and resources to retain their financial assistance. Additionally, the Marketplace received substantial feedback from key stakeholders including both the consumer advocacy and issuer communities suggesting more data is needed about consumers experiencing an adjustment to their

financial assistance for failure to resolve their income DMIs. The Marketplace also heard repeatedly from HHS leadership, the White House, Office of the Inspector General (OIG), Government Accountability Organization (GAO) and the press, among others, on the significant importance of data collection and transparency with the income verification process.

The high volume, ~ 4 million in 2015, of consumers experiencing an income verification issue paired with the overwhelming amount of feedback on the income verification process from a diverse set of stakeholders highlights the need for immediate action to improve the Marketplace's analysis and evaluation of this program. Studying the population impacted by income DMIs and enacting needed policy changes is an ongoing effort realized over a number years. However, it's important for the Marketplace to engage in aggressive data collection, analysis, evaluation and course correction now, or risk permanently losing these new enrollees due to frustrations and lack of affordable premiums. Worst of all, the Marketplace is at risk of preventing consumers from accessing much needed health care services and reducing the health security of the target population in which the program is spending significant resources to enroll.

The income verification process is impacting most of the consumers requesting financial assistance in the Marketplace. However, it is worth investigating if certain types of consumers are struggling more than others to determine if with careful targeting the Marketplace can intervene earlier with these consumers and prevent the reduction or loss of APTC. Therefore, the aim of this study is to engage in a robust data collection effort to develop a deeper understanding of the Marketplace consumer population who is losing financial assistance as a result of the income verification process. Such an effort will increase the Marketplace(s) knowledge and education of impacted consumers and improve resource allocation and targeted interventions, such as the addition of highly trained eligibility support workers and additional coordination of call center resources and improved Marketplace noticing, that will ultimately inform larger scale program changes to resolve a greater number of income data matching issues. Appendix A introduces the Marketplace Income Verification Data Analysis Framework, which was envisioned in order to establish organization and logic to this massive data

collection effort and to provide a pathway to the specific goals and objectives of this project. At a high level, the goal of this two-part Framework is to capitalize on improved data collection and reporting to inform more targeted interventions such as outreach and education and ultimately reduce the number of DMIs generated, increase resolution rates and maximize enrollment of eligible populations.

Specifically, this study will achieve the following objectives:

1. Identify and create an appropriate data set by which to establish the baseline population of consumer households impacted by the income verification process for failure to resolve their DMIs;
2. Establish a set of descriptive statistics which will identify the attributes of the consumer households in the data set;
3. Collect and present data on the relationship between income DMIs and current Consumer Assistor Programs; and
4. Use data mining techniques to investigate whether meaningful groupings of household consumers can be established among the large data set to better understand the impacted consumers and to see if we are able to identify the profile of consumers most at risk of losing all their APTC and CSRs for failure to resolve the DMI.

By developing a baseline data set, collecting descriptive statistics and using data mining techniques, this research will achieve the following goals:

1. Provide the Marketplace, and eager stakeholders with much needed consumer data never collected and aggregated for this purpose to date;
2. Establish data for initial baseline measurement and for use for comparative purposes in future open enrollment periods;
3. Allow the Marketplace to start a conversation about what is actionable from the data collected in consideration of resource allocation for both short term projects (for example pilot projects aimed at providing additional resources in the form of special trained eligibility workers, improved technical assistance materials and noticing and coordinated outreach to the most at risk consumers and inform

improvement efforts) to the more medium and long term projects such as future allocation of assistor resources and policy changes.

Background

Landmark health reform passed in 2010 consisting of two pieces of legislation: The Patient Protection and Affordable Care Act (Pub. L. 111–148) enacted on March 23, 2010 and the Health Care and Education Reconciliation Act (Pub. L. 111–152) enacted on March 30, 2010. Jointly the legislation is referred to as the Affordable Care Act "the ACA". The ACA enacts a fundamental shift in the United States healthcare delivery system by aiming to provide near-universal access to affordable health coverage.

One of the cornerstones of the ACA is the establishment of health insurance "Marketplaces" which are streamlined, one-stop, shopping experiences for consumers and small employers to search and purchase health insurance products. The Marketplaces are web-based and permit consumers to apply, receive an eligibility determination and select a plan online, with the option to apply by paper or through the Marketplace Call Center. The Marketplaces also perform identity verification and determine consumer eligibility for both coverage and financial assistance. Section 1321(c) of the ACA provides for the Secretary of the U.S. Department of Health and Human Services (HHS) to operate a Marketplace on behalf of any state that does not elect to establish a Marketplace. The Marketplace operated by the federal government is hereafter referred to as the "federally facilitated Marketplace - "FFM" or "HealthCare.gov" and is largely administered by the Center for Consumer Information and Insurance Oversight (CCIIO), a center within the Centers for Medicare and Medicaid Services (CMS).

The collective Marketplaces, both Federal and State, went live on October 1, 2013. This was an extremely short period to implement such a far reaching, complex and publically administered set of legislative actions. As well publicized, the roll-out of the ACA faced significant challenges in the early months, raising questions about the ability of the government to implement such a large scale program under such a condensed timeframe.[ii] The ACA also faced multiple court battles that threatened to undermine major underpinnings of the law, such as the individual mandate (*National Federation of Independent Business v*

Sibelius, 2012). Although the mandate was narrowly upheld, the ruling paved the way for more than twenty states to refuse to expand Medicaid coverage for lower income Americans by a lessening of the Secretary's enforcement authority.[iii] The *King v Burwell* case posed a significant challenge to the provision of Marketplace subsidies for consumers purchasing health insurance in the federally run Marketplace, but this aspect of the legislation was upheld in a 6 to 3 decision in June, 2015.[iv] Much ingenuity and creativity was employed to overcome such major challenges and implement significant policies and programs in a timely way in order to successfully enroll millions of consumers within the first two years of operations. The third open enrollment period started on November 1, 2015 with nearly 16.4 million previously uninsured consumers gaining access to coverage under the ACA since the inaugural open enrollment period in October, 2013, representing a 35 percent reduction in the uninsured rate.[v]

The Marketplaces continue to attract new consumers while also focusing on maintaining current enrollment. One of the most complicated and high profile components of the Marketplace is the establishment and implementation of the comprehensive eligibility and enrollment requirements to verify eligibility for consumers applying for Marketplace coverage. Ideally eligibility criteria are verified real time, automatically by the Marketplace Data Services Hub ("DSH" or "Hub") as the consumer populates the online application at HealthCare.gov. However, there are many reasons as to why additional verifications, referred to as the "alternative verification process" or "manual verifications" are required when data inconsistencies or data matching issues (DMIs) are identified during the application process. The additional verification may include a request for income documentation to verify household income for financial assistance or to verify status as a United States citizen or lawfully present immigrant, required to be eligible for Marketplace coverage. Millions of consumers are subject to the alternative verification process each plan year and thus it is critically important for the Marketplace to analyze comprehensively the verification process and balance program integrity measures with an optimal consumer experience where individuals and families receive the benefits for which they are eligible.

Developing a robust understanding of the complexity of eligibility verification and a deeper understanding of the impacted consumers will only serve to improve Marketplaces interventions and ultimately the consumer experience.

Marketplace Eligibility Criteria and the Trusted Data Sources

Consumers interested in purchasing coverage from the FFM have the option to apply online via HealthCare.gov, submit an application through the Marketplace Call Center, or submit a paper application. An applicant may apply for coverage for him/herself individually, or apply for coverage for two or more applicants as a family. Additionally, a non-applicant, household tax filer, may apply for coverage on behalf of family members seeking coverage. The Marketplace offers applications to request financial assistance in the form of a tax credit and cost sharing reductions (CSRs), and a shorter version of the application for those not requesting financial assistance. For those applicants seeking financial assistance, eligibility for financial assistance is established at the household level based on the projected household income of the tax household aligned with how an individual, or family, would file taxes during the annual tax filing season. Throughout this paper, most often the term "consumer(s)" will be used to describe individual or family tax households who are served by the Marketplace.

In order for the Marketplace to determine an applicant eligible to enroll in a qualified health plan (QHP), the applicant:[2]

- Must be a resident of the Marketplace state in which he/she is applying;
- Must be a U.S. citizen or naturalized or be lawfully present; and
- Cannot be currently incarcerated, other than incarceration pending the disposition of charges.

The Marketplace performs electronic verification using external trusted data sources (TDS) to confirm eligibility for a QHP available through the Marketplace and financial assistance for both the premium tax

[2] 45 CFR § 155.305, *Eligibility Standards*

credit or subsidy, often received in advance and referred to as the advance payment of the premium tax credit (APTC) and CSRs. The trusted data sources include federal entities such as the Internal Revenue Service (IRS), the Social Security Administration (SSA) and the Department of Homeland Security (DHS). Other data sources are non-federal and include Experian and Equifax, used for identity proofing and income verification, respectively. Table 1 displays a high level overview of Marketplace eligibility verification and the relevant trusted data sources.[3]

Table 1: Verification of Marketplace Application Information by Trusted Data Source

Trusted Data Source (TDS)	Eligibility Criteria Verified for QHP Eligibility and Financial Assistance
Social Security Administration (SSA)	U.S. Citizenship SSN Validation Death Incarceration Monthly and Annual Title II Income
Department of Homeland Security (DHS)	Naturalized Citizenship and Lawful Presence (immigration status)
Internal Revenue Service (IRS)	Tax Return Data Maximum Advance Payment of the Premium Tax Credit (APTC) Calculation
Equifax	Current Wage Income
Experian	Identity proofing

[3] 45 CFR § 155.315 *Verification process related to eligibility for enrollment in a QHP through the Exchange*

Office of Personnel Management	Employer Sponsored Coverage – Minimum Essential Coverage (ESC MEC)
State Medicaid/CHIP Agencies, Medicare, Veterans Health Administration, TRICARE (DOD), Peace Corps	Non Employer Sponsored Coverage (Non ESC MEC)

Advance Payments of the Premium Tax Credit and Cost Sharing Reductions

The ACA offers two primary pathways for financial assistance, including eligibility for income-based Medicaid administered in each state and available at varying federal poverty level (FPL) standards, and subsidized health insurance through the Marketplaces; these two pathways are referred to as the "affordability programs". Generally, Marketplace subsidies are available to non-elderly adults with household incomes between 100 and 400 percent of the FPL without access to affordable employer sponsored coverage meeting the ACA minimum value standard. Eligibility for subsidized coverage through the Marketplace is calculated using a standard referred to as Modified Adjusted Gross Income (MAGI) established at the household level. MAGI include wages, salaries, tips, taxable income, unemployment compensation, among other sources of income, and allows for certain deductions.[4] The Marketplace application and associated Marketplaces resources (tip sheets, pop-up help modals, etc.) guide the applicant through the request for financial assistance section of the application in an effort to most accurately project the household MAGI and the accurate amount of maximum APTC and CSRs.

The premium tax credit is available as an advanceable and refundable tax credit and the consumer can choose to have up to the eligible maximum tax credit paid directly to the chosen health plan to reduce the monthly cost of premiums, or the consumer can choose to claim the tax credit in full when filing an annual tax return. The vast majority of consumers eligible to receive a premium tax credit chose to

[4] 26 CFR 1.36B-1(e)(2)

receive some or all of the tax credit in advance and thus are required to reconcile the amount of tax credit paid in advance with the actual credit the household is eligible for at the time of tax filing. Consumers benefiting from CSRs are generally otherwise eligible to receive APTC, have household income between 100 and 200 percent of the FPL and select a silver plan category[5] of Marketplace coverage. Eligible individuals who are American Indian or Alaskan Native are also eligible for special CSRs up to 300 percent FPL.[6] Unlike APTC, CSRs are not subject to the tax reconciliation process. Consumers are required to pay back all or a portion of APTC received in excess of the premium tax credit (PTC), that the household was determined eligible for during annually tax filing, subject to repayment caps. The repayment caps limit consumer exposure and are based on FPL levels determined during tax filing. They also are based on a scaled repayment structure where households with annual income at or below 400 percent of the FPL are subject to a lesser cap (for example $2,500 for a family between 300 and 400 percent of the FPL) and those above 400 percent of the FPL are subject to the maximum repayment amount for a single individual or couple and families, with essentially no limit on the amount of APTC required to be paid back.[7]

Generation and Resolution of Data Matching Issues

The Marketplace seeks to automatically electronically verify as much information as possible, including household income, while a consumer is completing an application in real time; however if certain information attested to by the applicant cannot be verified by the TDSs, (for example the IRS or SSA) an inconsistency, or data matching issue ("DMI"), is generated and the consumer enters the alternative

[5] Plans in the Marketplace include four health categories, bronze, silver, gold, or platinum based on the percentage the plan pays for the overall cost of providing essential health benefits to members. The percentage the plans will spend, on average, are 60% (bronze), 70% (silver), 80% (Gold) and 90% (Platinum).

[6] Eligible Native Americans/Alaskan Natives are eligible to receive cost-sharing reductions without selecting a silver-level plan if their income does not exceed 300 percent of the Federal poverty level (ACA §§ 1402 and 2901 and 45 CFR § 155.350).

[7] 26 CFR 1.36B-4 *Reconciling the premium tax credit with advance credit payments*

verification process.[8] When such a DMI is generated, consumers are required to submit additional documentation in support of their attestations to resolve the DMI on record with the Marketplace and prevent an adverse action to adjust eligibility. Typically a consumer is provided an inconsistency period of 90 or 95 days to provide evidence, for example of household income or citizenship/immigration status.[9] The consumer is pended eligible for a QHP and financial assistance while the verification issues are being processed, however if left unresolved the consumer risks losing his/her QHP eligibility if not verified as a U.S. citizen or lawfully present, or risk an adjustment to financial assistance if the attested household income is not verified. Documentation submitted to the Marketplace is reviewed and analyzed by a large Marketplace vendor, referred to as the eligibility support contract, where thousands of workers, under the direction of CMS, handle the resolution, adjustment and termination of consumers with DMIs. Table 2 provides a high level overview of the Marketplace DMIs and the consequences of not resolving the DMI in a timely manner.

Table 2: Marketplace QHP Data Matching Issue Types and Consequences for Failure to Resolve

Marketplace QHP Data Matching Issues	**Consequences of not Resolving Timely**
Citizenship/Immigration Status (or lawful presence)	Terminate QHP Coverage
Household Income	Adjust (recalculate) levels of APTC and CSR based on available income data from IRS, or Equifax. If no data are available for the tax household, APTC/CSRs are reduced to zero.
Access to other qualifying coverage (affordable employer sponsored coverage that meets minimum value, access to Medicare, Medicaid, VA, Peace Corps, etc.)	Loss of all financial assistance (APTC and CSR) associated with a QHP plan

[8] 45 CFR § 155.315 (f) *Inconsistencies*
[9] 45 CFR §155.315, *Verification Process Related to Eligibility for Enrollment in a QHP through the Exchange*

Status as an American Indian/Alaskan Native	Loss of special CSRs provided to this population
Incarceration	Terminate QHP Coverage; currently not in effect as the Marketplace has the authority to accept a consumer's attestation that they are not currently incarcerated as a sufficient verification.

Income Data Matching Volume and Challenges

The Marketplaces' inaugural Open Enrollment Period (OEP) ran from 10.1.13 through 3.31.14 and was extended until 4.19.14 under a Special Enrollment Period (SEP). For the first OEP approximately three million DMIs were generated for enrolled consumers. Generated DMIs were over four million if all consumers were counted (both enrolled and not enrolled) and by including the full plan year, with SEPs.[vi] As a result of the high volume of DMIs, the Marketplace swiftly implemented the beginnings of a manual eligibility verification program in the early months of 2014. Such efforts included multiple outreach campaigns, including letters, phone calls, and an email effort encouraging consumers to pay attention to Marketplace notices and submit supporting documentation to resolve their DMIs and maintain current eligibility. There was also coordination, including data exchange, with insurance companies to reach out to consumers to encourage documentation submission and ongoing collaboration with the network of consumer assistor resources. With these efforts, the Marketplace successfully managed to resolve approximately 1.5 million DMIs, across all DMI types in 2014.

For plan year 2014, the Marketplace exercised flexibility offered under the statute and extended the deadline for consumers to submit documentation to verify their application information. The Marketplace only took action to terminate or adjust approximately 200,000 *enrolled* consumers with income or citizenship/immigration data matching types who made *no* attempt on record with the Marketplace to resolve their issues.[10,11] The Marketplace referred to these consumers as "radio silent" as these households

[10] ACA § 1411(e)(4).

did not submit any form of documentation to verify eligibility. The remaining enrolled consumers with open DMIs rolled forward as part of auto re-enrollment to 2015 plans with open DMIs. The FFM faced oversight pressure from auditors not satisfied with the approach to data matching resolution for the inaugural open enrollment period. Specifically, in June 2014, the Office of the Inspector General (OIG), published findings suggesting for the time period starting in October 1, 2013 the Marketplace experienced significant challenges with the data matching program and was unable to resolve the vast majority of the highest volume DMI types related to income and citizenship/immigration issues. The report also highlighted the limited available data on consumers with DMIs as a weakness for evaluative and analytical purposes. CMS largely concurred with the findings of the OIG.[vii]

The Marketplace entered year two of operations with a more comprehensive and timely outreach strategy along with additional stakeholder education, training, an increase in eligibility support workers and significant functionality improvements associated with the IT infrastructure of the Marketplace and HealthCare.gov. In 2015, as required in regulation and statute, the Marketplace moved to regular monthly action against consumers with unresolved DMIs who did not successfully provide sufficient documentation within the required timeframes. The approach of taking monthly action to routinely adjust APTC challenges the ability to make meaningful comparisons across the 2014 and 2015 plan years in regards to generation, resolution and adjustment of income DMIs. Monthly action also meant that the number of adverse actions against consumers who failed to resolve their income issues increased significantly as consumers were now required to act in a timely manner or risk a change in coverage. In 2015, the Marketplace also took action against consumers regardless of enrollment status in order to address the data issues in a timely way for those consumers who might return to the Marketplace and later enroll. Taking monthly action on consumers regardless of enrollment status also increased the total volume of actions.

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[11] Marketplace, March 31st 2015 Effectuated Enrollment Snapshot available at: https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2015-Fact-sheets-items/2015-06-02.html. Accessed January 2, 2016.

The Marketplace routinely releases quarterly effectuated enrollment snapshots to assess Marketplace strength and growth rates. In December 2015, HHS released the third quarter effectuated enrollment snapshot, including activity through September 30, 2015 for those individuals who paid their premiums and had an active policy. According to this most updated snapshot, the effectuated enrollment, which means the consumer has enrolled in a plan and paid the premium, for the 37 states using the HealthCare.gov platform (referred to as FFM or HealthCare.gov states here) was 6.7 million. Effectuated enrollment was 2.6 million for the remaining SBM states, such as Maryland and Massachusetts. Eighty-four percent, or approximately 7.8 million of the total number of consumers counted here were receiving APTC and 57 percent, or about 5.3 million, had the benefits of cost sharing reductions to help lower their out of pocket health care costs. [viii]

The September 2015 snapshot does represent a dip in enrollment from the June 30th snapshot where the effectuated enrollment was 7.2 million and 2.7 million for the HealthCare.gov and SBM states respectively. Some of this reduction is certainly attributed to the large volume of ongoing DMI activity throughout 2015 as well as consumers gaining access to other forms of health insurance outside the Marketplace. Assistant Secretary for Planning and Evaluation, Richard Frank, offers the following explanation in the most recent effectuated enrollment snapshot, "As the provisions of the ACA have taken effect, about 17.5 million Americans have gained coverage, and the uninsured rate has been reduced by 45 percent since 2010. The third quarter decline in effectuated enrollment likely reflects our ongoing income data matching efforts, particularly in the second quarter [of 2015], people gaining other coverage outside of the Marketplace, such as through a new job, and other decisions about continuation of coverage."

Through the June 30, 2015 snapshot, ~967,000 enrolled HealthCare.gov households with income DMIs experienced an adjustment to their APTC and/or CSRs for failure to resolve their DMIs. Actions taken against consumers, often referred to as "clock expiration," through June 30th represents by far the heaviest volume months of data matching activity as this time period aligns with the end of the rolling 90-day

period starting with beginning of open enrollment on November 15th, 2014.[ix] According to the more updated September 30, 2015, quarter three snapshot, approximately 186,000 enrolled households were adjusted for an income DMI between the time period of July 1, 2015 through September 30, 2015. Interestingly, approximately 44,000 of these households were previously adjusted for failure to resolve an income DMI. Precise analysis of the relationship of the number of applicants, counts of effectuated enrollment, and counts of consumers with data matching issues generated, resolved and adjusted is complicated secondary to the Marketplace's approach to data collection and verification in the first two years of the program and also because consumers can return to the Marketplace and update their status' multiple times within the same plan year. Regardless of the data limitations for plan year 2015, the Marketplace confirmed action on over a million enrolled consumers who failed to successfully resolve their income DMIs. This count increased to approximately 1.4 million income DMIs adjusted without regard to enrollment status. The Marketplace estimates approximately 2.2 million income DMIs were resolved as of November 1, 2015 without regard to enrollment status and with resolution defined as resolved by document review, consumer reported a life change with the Marketplace resolving the DMI, or other action to remove the income DMI.[x]

Even with the significant improvements aimed at both reducing the generation of DMIs and improving the resolution of DMIs, the Marketplace continued to experience a very high volume of income DMI activity for the 2015 plan year. The attention on data matching, particularly for income DMIs, was substantial throughout both 2014 and 2015 from a diverse set of stakeholders, including inside the government at the highest levels of health policy, advocacy groups, health insurance issuers with significant concerns about the impact to their respective enrollments, and the press. Moreover several additional reports by the Government Accountability Office (GAO) and the HHS Inspector General Office (OIG) emphasized the need for additional program integrity measures in responding to data matching issues.[xi,xii,xiii,xiv]

Two years of operations demonstrates the multiple challenges with successfully preventing and resolving DMIs related to the verification of projected annual household income. The income verification process is complicated and projecting future household income is hard for many households, and particularly for the low income households the Marketplace aims to serve. Consumers struggle to understand the outreach notices and documentation requirements also present unique challenges even when standard pay stubs, W2s and tax documents are available. There are limitations in matching consumer data with the IRS, particularly when social security numbers, which are optional on the application but are required for successful verification, are missing and Equifax data are often unavailable as a source of income verification. Often households are losing all APTC/CSRs because there are no data available to use for the maximum APTC recalculation during the DMI adjustment. These consumers will lose their entire upfront subsidy and for most, coverage becomes unaffordable. Many of these consumers are subsequently at risk from being terminated by their health care plans for failure to pay premiums in a timely manner.

Research from the first two years of operations also demonstrates that many consumers fail to submit documentation at all and certain consumers who do submit documents struggle to submit information sufficient to resolve their income issue. Data from 2015 demonstrated approximately 77 percent of all consumers who experienced adjustments for an income DMI did not submit any form of documentation. Therefore, the Marketplace has to balance significant pressure of heightened program integrity measures and the requirements of a comprehensive income verification process required by law while maximizing the experience and enrollment for those millions of consumers who are eligible.

With the third open enrollment period well underway and 2016 data matching volume yet to be seen, the Marketplace is incentivized to pursue program and policy improvements aimed at reducing the overall number of income DMIs generated and increasing the resolution of DMIs where generated. Obtaining improved data on consumers experiencing income DMIs is a must for executing improved outreach and education campaigns. A critical first step is establishing credible data that will allow for comprehensive research and analysis on consumers adversely impacted by the income verification process so the

Marketplace can better target the limited available resources to assist consumers in verifying income to maximize enrollment.

Research Project Goals and Objectives

This research project will specifically focus on income DMIs in the Federal Marketplace. The goal of this study is to develop a more in depth understanding of the Marketplace consumer population losing APTC and/or CSRs due to unresolved income data matching issues in an effort to improve the Marketplace's knowledge for improved data analytics, measurement and evaluation, improved resource allocation, and improved targeted interventions. Appendix A introduces and summarizes the Marketplace Income Verification Data Analysis Framework. Specifically, *the Framework, which was newly developed by the CMS program lead,* describes the current day scenario of over 1 million adjustments for failure to resolve income DMIs and establishes a data action plan based on gathering additional information and credible data about those consumers who were adjusted during the 2015 plan year. The *Framework* includes a two phased approach. At a high level, Phase 1 establishes the descriptive and summary statistics for consumers who experienced an adjustment for an unresolved income DMI in 2015. Phase I provide data on age, sex and geographical location and will also include information about the available Marketplace assistor resources by region. At a more granular level, Phase 1 includes all the efforts to identify the appropriate data set, scrub and de-duplicate the data from multiple Marketplace databases, identify the relevant variables, establish variable definitions and ultimately identify gaps in the data for future research. The end goal is for Phase 1 data to inform *population* level interventions in future open enrollment periods for improvements in targeted consumer education, eligibility workforce training, technical assistance materials, and stakeholder engagement aimed at improving the verification experience for a meaningful cross section of the Marketplace.

Phase 2 introduces a data mining technique referred to as the cluster analysis to first assess if meaningful groupings of "high risk" consumers can be identified based on similar characteristics among a large data set of consumers adjusted for unresolved income DMIs, and second to establish a prediction model used

to identify similar "high risk" consumers in future populations based on shared characteristics. Once successfully identified, these "high risk" consumers may receive additional, consumer level intervention, such as additional targeted outreach, notification and 1:1 assistance from specially trained eligibility support workers who can take the consumer individual through the end to end verification process.. In summary, the goal of this two-part Framework is to capitalize on improved data collection and reporting to inform more targeted interventions such as outreach and education and ultimately reduce the number of DMIs generated, increase resolution rates and maximize enrollment of eligible populations.

The remaining four chapters describe the study background, *Framework* and results. Chapter 2 offers a literature review covering topics salient to the topic of Marketplace income verification such as income volatility, health literacy and the burden of documentation requirements in means-tested programs. The literature review also highlights the limited available research directly analyzing the impact of income verification and tax reconciliation on Marketplace consumers. Chapter 3 (*Methods*) describes the Marketplace Income Data Analysis Framework and provides a detailed description about the methodology and approach to the study. Chapter 4 *(Results)* comprehensively summarizes the results of the first two phases of the *Framework*. Finally, Chapter 5 (*Discussion and Recommendations*) summarizes how the Marketplace can utilize the study results for improved population and consumer level interventions aimed at maximizing the consumer experience and enrollment of eligible consumers.

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Chapter 2 Marketplace Income Verification and the Affordable Care Act: *Literature Review*

Background

As the Marketplace concludes the third open enrollment period there is a growing body of research assessing the impacts of the ACA on enrollment, access to care and health outcomes.[xv,xvi, xvii] However there is limited research on the income verification process and structured subsidies offered in the federal Marketplace, including the adjudication of millions of income DMIs, using consumer data. While analysis efforts are underway at both the Marketplace and the IRS, limited data are available comprehensively analyzing both the experience of Marketplace consumers' and program integrity impacts of the income verification process for subsidies. Nor are there available demographic data about Marketplace consumers experiencing income DMIs and the characteristics of consumers most likely to lose access to APTC/CSR as a result of data inconsistencies. There is also limited research on best practices for targeted outreach and education campaigns specifically aimed at the income DMI verification process. With well over a million consumers losing access to part or all of their APTC and CSRs as a direct result of data issues it's critical to further develop the body of available research in this area.

While there is limited research directly addressing income verification and data matching in the federal Marketplace there is existing research on the challenges of eligibility verification processes on relevant vulnerable populations. Studies demonstrate the importance of understanding income volatility in means tested programs, the complications in projecting household income, and other income dynamics representative of challenges faced by Marketplace consumers. Research modeling the impacts of the premium tax credit on the tax reconciliation process is relevant to this academic endeavor along with preliminary data from the IRS regarding the first tax filing season requiring APTC reconciliation. There is relevant research on health literacy and struggles of consumers to understand key provisions of the ACA, including the tax subsidy. Available research also highlights the challenges and administrative burden for

both programs and consumers when documentation is required for eligibility verification. Regarding the methodological approach to the *Framework*, related research demonstrates how data mining techniques such as audience segmentation and cluster analysis are effective methods to organize data to draw conclusions about the shared characteristics of "high risk" consumers aimed at improving outreach, messaging and targeted interventions. The literature review also summarizes guidance from successful outreach techniques in other public programs serving similar populations and explores available research on the importance of Marketplace Assistor and Navigator programs. The subsequent sections summarize the research by subject with a discussion of the relevance of each section to the Marketplace income verification process. Secondary to the available literature, and germane to several of the key components of the income verification process, the literature review is structured to address those areas that are most likely associated with most challenging components of income verification, for example the complications of verifying income for purposes of financial assistance for a tax credit or CSR when household income changes frequently within a calendar year as well as the challenges of following income verification procedures and requirements with limited health literacy which presents challenges in comprehending key terms such as "APTC", "tax credits" and "verification". To maintain an organized framework for the literature review each section covers a key challenge to the income verification process most articles were identified via searches on "income verification in public programs", "consumer challenges with the ACA" and terms such as "health literacy in the ACA" and "eligibility requirements and the ACA", among others.

Estimating and Reconciling Income Presents Complications

The Marketplace(s) approach to providing financial assistance to eligible consumers in the form of a tax credit paired with CSRs proves challenging in several key aspects. Each applicant in an applicant's tax household are asked to predict their income for the upcoming plan year (which may be the upcoming calendar year, or the current calendar year, depending when an application is submitted) in order to

estimate the projected household income. The Marketplace compares the total tax household attested projected income with the latest available tax data from the IRS and annual SSA data (as necessary). If the annual household projection cannot be verified using the IRS or SSA data, then the projection is compared against wage information provided by Equifax and in certain cases monthly SSA data, as available. If the consumer attestation is reasonably compatible with the available Marketplace data, the projected income is considered verified for the purposes of the MAGI calculation and the eligible maximum amount of APTC and CSRs. If federal tax data are available, and the attested annual household income is greater than 10 percent less that the information available with the data sources, the applicant tax filer(s) are asked whether they have stopped working, worked less hours, or changed jobs in an effort to explain the difference between the household attestation and the available Marketplace data. If the applicant answers "yes", the Marketplace will accept the provided attested income projection for the purposes of establishing the tax household's eligibility for APTC and CSRs. If the applicant answers "no" to the discrepancy with the tax data, and the household annual income projection is also greater than 10 percent less than Equifax data (when available) an income DMI is generated. An income DMI is also generated when there are no available income data from any of the TDS for the tax household. This can happen for a number of reasons, including not all the SSNs were provided for the required members of the tax household, a change in the construct of the tax household such as a name change or divorce, or the applicant has not recently filed taxes.

Applicants determined eligible for PTC are offered a choice to have the tax credits paid directly to the issuer as APTC or receive a refund at the end of the year when filing their annual tax return. Applicants whose tax household earn more income than projected during the plan year are required to repay the extra amount of APTC when taxes are filed subject to the repayment caps. Benefits of CSRs received during the plan year are not subject to reconciliation at tax time.

The amount of APTC for which an applicant is eligible depends on a number of factors including household income of the tax filer and dependents and the premium of the selected QHP in the relevant

rating area, and the selected APTC amount may cover all or part of the premium depending on the circumstance. Depending on FPL and selection of the second lowest cost silver plan, and other special circumstances, such as status as an eligible Native American or Alaskan Native, an applicant may also be eligible to benefit from CSRs. HealthCare.gov and the associated application sections on "Help Paying for Coverage", are designed to assist the applicant through the application and enrollment process.

The Marketplace offers a number of resources, including the Marketplace Call Center armed with thousands of help desk workers accepting live calls to assist consumers, help tips and application modals to aid in the application and enrollment process. The Marketplace also has a large network of Marketplace Consumer Assistor Programs such as Certified Application Counselors and HHS funded Navigators among others available to assist consumers. Even with these resources, the application and income verification process is arduous. For one, while real time, seamless, electronic eligibility verification is the objective of the modern day Marketplace and is successful for many applicants, for a large number of consumers there is no electronic data match to verify income. Unlike other long standing public programs with complicated eligibility criteria, the modern day Marketplace is designed for consumers to independently populate the application, including navigating eligibility verification and uploading required document submission where necessary; this process differs from the days of visiting a State Agency and working with an in-person skilled eligibility worker. In the Marketplace, the eligibility workers work behind the scenes to process documents once the consumer has submitted documentation for a DMI.

Additionally, consumers are required to report changes in income and household composition (secondary to the relationship of APTC and the tax household) to the Marketplace throughout the plan year. Reporting a life change is designed to both provide consumers the APTC/CSRs in which they are eligible during the plan year while also protecting the consumer at tax time. However, a new income DMI may be generated each time a consumer reports a life change which in effect requires consumers to validate their income, often with documentation, multiple times within the same plan year.

The combination of the respective eligibility processes--including navigating the application, building the correct tax household with all the required information, projecting within narrow margins annual income with often dated tax records, required reporting rules for life changes and documentation submission requirements--are burdensome for consumers reporting stable income within or across years. These requests are exponentially more complicated for consumers who experience variable income, including millions of consumers who work part-time or are seasonally employed, are tip dependent, or are self-employed. Often those consumers who have the most to gain from the affordability programs offered by the ACA face the largest struggles with income verification. These same consumers are also most likely to generate income DMIs as their attestations don't align with Marketplace electronic records, and notably these consumers will also have the hardest time documenting income aligning with their attestation as their within year income is variable.

Income Volatility

Income mobility or volatility is studied in numerous fields including in labor economics and health policy. Research demonstrates year over year income volatility on the rise for the last thirty years with estimates of volatility in family income doubling over the past few decades.[xviii] Not surprisingly research shows the greatest volatility is felt among those at the bottom ten percent of the income distribution.[xix]

Research also details the complicated dynamics of income and the approach to the subsidies offered under the ACA using modeling and secondary data sources. Several studies have modeled the dynamics of family income, the significant variability of household income and other family dynamics on frequent changes in eligibility for public programs. Modeling by Shore-Sheppard in 2014 using the Survey of Income and Program Participation (SIPP) and the primary subsidy categories for MAGI standards offered under the ACA found for eligible consumers incomes were "highly variable within a year" and this was more so true for individuals at lower incomes.[xx] This research described how employment transitions, periods of non-employment and changes in family structure are strong predictors of income changes

sufficient to frequently change eligibility categories aligned with the ACA. The significance of the Shore-Sheppard research was the focus on *within-year* income variability of consumers likely to be eligible for Marketplace subsidies. Specifically, this work examined the fluidity of within-year family income volatility for eligibility categories critical to the ACA, demonstrating that incomes were more fluid at the bottom end of the income distribution: only 10 percent of the population spent all year in the same income category associated with Medicaid levels (traditionally under 138 percent) vs. 25 percent of the studied population who spent the full year in the income strata associated with the highest FPL levels just above Marketplace subsidy levels (400 % FPL).

Importantly, the categories of consumers most likely to qualify for ACA subsidies (cohorts between 138 percent and 400 percent of the FPL) demonstrated the greatest overall amount of fluidity with only 10 to 13 percent of the group spending all year within one FPL category. This finding suggests that a very large portion of this population experiences income changes not only sufficient to change the value of tax credit subsidies, but also changes in eligibility for other public programs (Medicaid to tax subsidies and reverse). This hypothesis is also supported by other research (again modeling using SIPP) demonstrating greater than 35 percent of low income families described as below 200 percent of the FPL would experience shifts in eligibility (often referred to as "churning") between Medicaid and the tax credits based on income variability within as soon as six months after gaining coverage. The potential for churning was greater than 50 percent when the full plan year was considered.[xxi] Similar results were found, again using SIPP, demonstrating barely over fifty percent of the APTC-eligible cohort of individuals with incomes between 133% and 199% would remain in the same income band year over year.[xxii] A more recent study using updated data from several national surveys, with state specific weighting and analysis, demonstrated a high rate of churn across all states with approximately half of the adults potentially eligible for Medicaid or subsidized marketplace coverage experiencing a change in eligibility within 12 months.[xxiii] Additional case study research from California demonstrated approximately 75 percent of predicted marketplace subsidies went to households experiencing income

changes of 10 or more percent between coverage years, with approximately twenty percent of these households experiencing income changes of greater than 40 percent.[xxiv] Such research highlights the extent of income volatility in low income populations and offers explanation of the early struggles of Marketplace consumers to efficiently verify income.

Reconciling the Tax Subsidy

Most, if not all, significant health reform proposals over the past twenty years have considered the dynamics of a retrospective vs. prospective determination and delivery of premium subsidies with each approach achieving differing policy and program priorities. Experts have argued that the retrospective subsidy or retrospective reconciliation generates the most fidelity to the eligibility rules governing the subsidy (and ultimately the correct subsidy amount based on actual tax year earnings for the household) while the prospective, or advanced payment, increases program participation and uptake of the immediately available subsidy, particularly important for low income households with limited access to liquid assets.[xxv] Past research, largely using simulation models, suggests the prospective model is biased toward overpayment, and providing an advanced subsidy for extended periods of time increases the error rate of the targeted subsidy amount, generating the greatest risk for subsidies provided to low income consumers who experience the most income changes within a year.[xxvi]

The Marketplace(s), in partnership with the IRS, mitigate the risk of inaccurate subsidies with a combination of the income verification process occurring real time at application submission, the generation and adjudication of income DMIs, the tax file requirement and reconciliation process, and the requirement for consumers to report life changes to the Marketplace during the plan year. On July 17, 2015 IRS Commissioner John Koskinen provided a letter to members of Congress with an update on preliminary results from the 2015 tax season.[12] In the letter, the IRS projected approximately 3.2 million tax payers filed a Form 8962 *Premium Tax Credit*, with approximately 3 million tax payers reporting

[12] To underscore how preliminary the data are, Commissioner Koskinen noted in his July 17th letter how typically data on tax returns are not published until approximately 15 to 18 months after the close of the tax year.

APTC out of the approximately 4.8 million taxpayers the IRS is estimating will need to file a return to claim PTC or reconcile APTC. The letter indicated 97 percent of tax payers claiming PTC also reported APTC. Approximately 2.7 million taxpayers claimed about $9 billion in total PTC with an average credit of $3400. Approximately 40 percent of tax filers claimed less than $2000, 40 percent claimed between $2000 and $5000, and roughly 20 percent claimed $5000 or above in tax credits. For the taxpayers who claimed PTC or reconciled APTC about 40 percent claimed net PTC and the eligible premium tax credit exceeded the APTC paid through the year; on average the additional eligible PTC was approximately $600. Approximately 50 percent of the taxpayers who reported APTC had APTC in excess of eligible PTC paid during the year with an average required repayment of $800, with 75 percent of this population owing less than $1000 and interestingly, 65 percent of this group still reporting an overall tax refund. For this population, the statutory repayment caps affected about 25 percent of those tax filers who reported excess APTC. According to the IRS .3 million or 10 percent of the taxpayers received the correct amount of APTC. The IRS also reported that just over 700,000 of the taxpayers with APTC had yet to file a return, or request an extension as of the letter and analysis is ongoing to learn more about these consumers and their intentions to file as required. [xxvii]

While the data from the IRS are very preliminary, the analysis provides the first look at how the approach to the ACA subsidies are influencing the consumer experience. This area of inquiry represents a vast opportunity for additional data collection and analysis aligned with current and future open enrollment periods. Specifically, as IRS data relates to income data matching issues, it's of tremendous value to understand in more detail how the consumers with income data matching issues are faring during tax reconciliation, including consumers who both resolve their DMIs and for those consumers who experience an adjustment at DMI clock expiration for failure to resolve an income DMI. Additionally, there is significant oversight interest in understanding the relationship of those consumers receiving APTC who fail to file a tax return in a timely manner or to file at all, as required by law and whether or not these consumers also have a higher rate of income DMIs. Effective 2016, consumers who fail to

reconcile their APTC will have subsides removed, regardless of income data matching issues, adding another layer of complication to the ACA subsidies.

While the final data are under analysis for the first ACA tax season, prior cases studies have also highlighted the risks associated with the design of the subsidies for Marketplace premiums as tax credits. One case study based out of CA found 38 percent of individuals receiving tax credits would be predicted to owe money at tax time if they failed to report income changes during the year, while 41 percent of consumers would receive a refund. The research suggested the percent of individuals owing a repayment would drop meaningfully to 27 percent if income changes of 10 percent or more were reported to the Marketplace and eligibility re-determined based on the revised income, with a notable reduction in repayments owed by those consumers reporting changes. Results of the research simulation stress the importance of reporting income changes with timely adjustments to eligibility determinations; this approach ultimately is estimated to have an impact of between 7 and 41 percent reduction in the number of consumers with subsides owing PTC, with reduction in the amount owed by as much as 61 percent. Importantly, this study also underscored the importance of mitigating consumer and program risk with significant consumer education about how the subsidies work in relation to the tax filing process, complete with consumer tools and aids.[xxviii]

The problem of income variability and churning in and out of eligibility for public programs is not new. Research now decades old highlighted churning concerns with Medicaid and CHIP programs (then referred to as "SCHIP") suggesting significant income volatility with adults and children with incomes under 200 percent of the FPL.[xxix] Studies describe the impact of churning in terms of reduced access to needed services and emphasize the importance of administrative simplification aimed at easing the burden on consumers and programs, while maximizing consistent coverage.[xxx, xxxi, xxxii] Modernized eligibility rules, such as twelve months of continuous eligibility in Medicaid help mitigate income volatility and ease consumer and administrative burden.

In summary, the above findings demonstrate important relevance for today's Marketplace. The data demonstrate the consumers most likely served by the ACA tax subsidies (those with income between 100% of the FPL and 400% of the FPL) experience the highest rates of both within-year and year over year income volatility. These are the consumers who generate millions of income DMIs annually. Income volatility will also make it harder to both automatically verify income in real time at application submission and to verify income via the document review process. The stakes are even higher for consumers who experience DMI adjustments outside of the open enrollment period, as they have to return to the Marketplace in a timely fashion while still enrolled in order to update their income and regain subsidy eligibility via the newly eligible for financial assistance SEP, only available to consumers who experience a change in income while still enrolled.[13] Those consumers terminated by their issuer for non-payment are not eligible to return to the Marketplace via an SEP, and have to wait until the next open enrollment period. Additionally, the concept of churn is significantly relevant for Marketplace consumers with the data showing predicted changes in income are not modest and not only associated with slight changes to subsidy eligibility, but instead mean the difference between program eligibility (moving from subsidized Marketplace coverage to Medicaid and the reverse).

In an ideal state, the Marketplace(s) income verification process will maximize coverage and appropriate tax credits, while also minimizing eligibility errors and administrative and consumer burden.[xxxiii] Fraud prevention and enhanced oversight is also critically important as the program is already subject to multiple OIG and GAO audits as aforementioned. Several key provisions of the ACA, including SEPs and the "report a life change" capabilities aim to reduce the burden on consumers with volatile income. Such policies, paired with an abundance of outreach and education about the Marketplace income verification process have led the Marketplace to resolve millions of income DMIs. However, as the Marketplace(s) matures, there is ample opportunity to learn more about how income dynamics impact consumers and how the Marketplace can target continued outreach efforts and enact policy revisions

[13] 45 CFR § 155.420(d)(6)).

where necessary, aimed at assisting eligible consumers at most risk for income DMIs and subsidy loss. Additional research in this area, particularly as more data becomes available from both the Marketplace and the IRS, is critical in informing how well the Marketplace(s) are doing with eligibility verification as related to program integrity measures, administrative burden and customer service. The next section will discuss how other dynamics such as health literacy and documentation requirements influence the income verification process.

Health Literacy and the Affordable Care Act

Significant research has been conducted regarding health literacy and the challenges of financial decisions relevant to the purchase of health insurance. Studies repeatedly demonstrate consumers struggle with key health insurance concepts often paired with limited financial literacy in the population the Marketplace(s) aim to serve, most often uninsured consumers under 400 percent of the FPL.[xxxiv, xxxv,xxxvi,xxxvii, xxxviii]A study completed in the weeks prior to the first open enrollment period in 2013 collected data on consumers' knowledge of the ACA and health insurance literacy using a nationally representative sample focused on populations impacted by the new law, including populations eligible for Medicaid and consumers below 400 percent of the FPL who were eligible for the new Marketplace subsidies. Results demonstrated that the overall knowledge of the ACA was low with the lowest income populations demonstrating the least amount of ACA knowledge. Low income consumers were 54 percent less likely to score above the median on questions regarding health insurance than those in the higher income categories. This low income population also experienced the lowest levels of financial literacy, demonstrating that those consumers most likely to benefit from the tax subsidies requiring important financial choices about health plan selection and tax credits are in the worst position to do so. [xxxix] Other research demonstrated that more than 60 percent of consumers targeted for the new Marketplaces would experience challenges understanding the fundamental principles and key concepts of the new plan.[xl] Research on a large

representative sample of adults in California found approximately a third of individuals with low health literacy were uninsured and applying this percentage to projected new enrollment via the ACA, suggested greater than 10 million of the consumers targeted for enrollment under the ACA would have low levels of health literacy.[xli] An additional survey from 2012, showed similar results where low rates of comprehension of key ACA provisions were found in populations in the income bands most likely to gain from the new ACA subsidies and Medicaid expansion. In this study only 26 percent of the sampled population, made up of 41 percent uninsured and nearly 70 percent of the sample reporting income less than $15,000 a year, understood how the ACA could help.[xlii]

In early 2015, the Alliance for Health Reform summarized numerous studies on consumer struggles with health literacy, highlighting importance challenges in implementing the ACA and proactive recommendations. This report cited research by Association of Health Insurance Plans (AHIP) indicating 9 out of 10 adults are challenged in decision making about health plans and also cited research by George Washington University which demonstrated low health literacy is estimated to cost the US economy between $106 billion and $248 billion annually.[xliii] The Alliance emphasized the importance of public and private initiatives aimed at improving health literacy, citing the importance of the Plain Writing Act, Healthy People 2020 and the National Action Plan to Improve Health Literacy.

A 2015 survey of Marketplace Assistor Programs found a continued lack of understanding of the ACA with the top three reasons for consumers seeking help reported as not understanding the ACA, not understanding health insurance, or lacking confidence to apply for coverage and financial assistance independently. Frequently cited reasons for seeking help included wanting assistance with questions about reporting household income and tax questions. This same survey also noted continued limited health literacy, with nearly 75 percent of the Assistor Programs reporting that consumers needed help to understand basic health insurance concepts such as “deductible” and “in-network services”.[xliv]

In summary, the research demonstrates consumers at the lower end of the income scale will experience a harder time understanding the principles of the subsidies, the income verification process and how to successfully resolve a data inconsistency to maintain current eligibility levels. Notably, all the reviewed studies focused on the health literacy challenges faced by consumers in comprehending the basic principles of the ACA and health insurance, suggesting the findings would be significantly more concerning if the seemingly more complicated concepts of projected annualized tax household income, income verification, data matching adjudication and tax reconciliation were investigated with more rigor. Work by Kreuter, et. al. (2014) highlights the need for effective outreach and enrollment strategies focused on health communication science. Five evidence-based recommendations are suggested and translated into action steps to support the Marketplaces (and Medicaid) in building outreach and education campaigns that consider health literacy dynamics. Recommendations emphasized the importance of clear messages and messengers, identification and prioritization of vulnerable populations and exploitation of the "information environment such as local media sources and community based-organizations.[xlv] The above research and recommendations germane to health literacy played an important role in establishing the *Framework* for this study; particularly the focus on improved data collection aimed at identifying the Marketplaces most vulnerable consumers (such as low-income populations and consumers who are non-English speaking) and the need to consider more targeted outreach and education campaigns. The next section discusses another complicating factor of the Marketplace income verification process, the limitations of the current electronic data sources.

Current Electronic Data Matching has Limitations

The Marketplace was designed with real-time, modernized electronic verification requirements in mind. Electronic data matching and verification is ideal as it saves consumers time and hassle, creates efficiencies in administrative resources, increases program participation for eligible consumers, promotes program integrity and overall reduces the error rates and inaccurate eligibility determinations.[xlvi] The

ACA brought about important changes in establishing eligibility criteria for the collective affordability programs, including new requirements for calculating and verifying eligibility in Medicaid, in addition to the newly established subsidies. Much of the new vision for eligibility under the ACA was intended to modernize and establish streamlined, data driven eligibility processes for all affordability programs. Such processes required both federal and state programs to either newly build or update existing systems to establish IT infrastructure designed to support eligibility rules engines, data exchanges and electronic verification, aimed at reducing the need for consumers to submit paper documentation in-person, among the other positive benefits aforementioned. In the ideal state of today's federal Marketplace all eligibility factors such as citizenship status and income are successfully verified real-time via the Hub as the consumer navigates through the rules engines and submits his or her application. However, there are a number of reasons as to why electronic income verification is not always immediately successful and consumers are required to submit documents through the alternative income verification process.

Data matches can be unsuccessful for a number of reasons including a change in the household composition such as a marriage or divorce since the most recent tax filing on record with the IRS, missing SSNs from relevant members of the tax household, failure of the data Hub to match an applicant's name, date of birth (DOB) and SSN with the IRS data, and no tax data on record with the IRS. As mentioned, a DMI will also occur when there are income data on file for the household, but the data are not "reasonably compatible" with the household projection for annual income. Once the income DMI is generated for the household the alternative verification process nearly exclusively relies on documents to confirm the household's attestation of projected annual income. The process for reviewing documentation is administratively burdensome and adds to consumer confusion as will be discussed in the next section. Thus the Marketplace is incentivized to pursue improvements in the use of electronic data matching with the IRS, SSA and Equifax and expand the exploration of other sources of data successfully used to verify eligibility in existing programs.

State-based Marketplaces and Medicaid programs offer examples of successfully maximizing electronic data sources for real-time, streamlined verification. A gap analysis performed by Manatt in 2011 concluded there are a number of state resources suitable for real time eligibility verification, or as part of a batch process, worthy of additional research at the Federal level. Manatt's research focused on Arizona, Massachusetts, Oklahoma, Utah and Wisconsin (the project was at the request of the New York Exchange team) and demonstrated potential data sources in state unemployment data, child support payment systems, State quarterly wage data, and state worker's compensation data among other sources.[xlvii] At this time, the federal Marketplace is not employing any of these data sources in either the automated verification process or the alternative verification process.

More recent work lead by Stan Dorn at the Urban Institute commissioned by HHS's Assistance Secretary for Planning and Evaluation (ASPE) also explored, via a series of reports options for further data integration offered under the ACA. Much of the focus of this work is on state level Marketplaces and Medicaid programs but there are important lessons learned and opportunities applicable to the federal Marketplace. Key lessons learned from the Urban Institute research suggests considerable effort is required to build integrated data systems but significant gains in terms of administrative efficiency, reduced consumer burden and increased program integrity are possible. Dorn's work suggests that key integration strategies cannot end with the technology and must also consider the integration of human beings in providing enrollment assistance and accessing data systems. Interestingly, Dorn's work also underscores how nearly all policies requiring consumers to take action to "obtain or retain benefits," such as documentation submission requirements, lead to vast reductions in participation levels.[xlviii] All of these principles are holding true in the federal Marketplace's current efforts with income verification and data matching resolution.

The Dorn research also models the efficiencies in eligibility verifications health programs can experience by exploiting eligibility overlaps in public programs. Dorn specifically cites the Earned Income Tax Credit (EITC), Supplemental Nutrition Assistance Program (SNAP), Women, Infants and Children (WIC)

and the Low Income Home Energy Assistance Program (LIHEP) as existing programs with meaningful eligibility overlaps, most specifically with newly eligible Medicaid adults under the ACA expansion rules. The research also indicates these programs will overlap with subsidized coverage offered by the Marketplace, suggesting as many as 21 percent of the consumers eligible for the subsidies will have an eligibility overlap with the EITC; the overlap was much lower for the SNAP and LIHEAP programs at approximately three and five percent respectively). Dorn also cites specific success stories in Louisiana's CHIP program where approximately 76 percent of their renewals are verified electronically based on data matching with other programs without burdening the applicants for additional information. Success is also experienced in Louisiana and in South Carolina where Express Lane Eligibility (ELE) takes full advantage of SNAP data to maximize Medicaid eligibility.

Dorn is also careful to point to the challenges of such IT modernization initiatives including cost, time, legal requirements to safeguard privacy and individual information, as well as technical differences between programs and the high degree of required coordination in building configurations and data exchanges. Notably, the need for champions in program leadership to establish and drive relationships as well as administrative resources is also underscored. The Marketplace faces all these challenges and more, including the added challenge of building partnerships with states choosing not to build a SBM and the large volume of consumers (millions) with data issues. However, as the generation of income DMIs in the federal Marketplace continues at strikingly high levels, it is important that the collective Marketplaces continue to evaluate the ability of additional data sources and employ innovation in the verification of income. There are lessons learned from innovations in Medicaid and CHIP programs exploiting data from other sources such as TANF and SNAP to verify household income. In addition, data sources such as state quarterly wage data and the Administration for Children and Families (ACF), New Hire Data Base hold significant promise to modernize and streamline the verification process, while also decreasing consumer burden and simultaneously maximizing enrollment and program integrity at reduced cost. While, such approaches may be complicated by a number of factors in the federal Marketplace including

reduced access to state level data, the need and expense of data use agreements, requirements restricting the use of certain data sets (use of certain data sets is statutorily defined) and privacy and security concerns, it's a cause worthy of additional investigation. The next section discusses the impacts of requiring documentation submission in eligibility verification.

Documentation Review

Document review and approval is a critical component of the alternative income verification process. There is limited academic research on the administrative and consumer burden of a documentation review process for income verification in the newly established Marketplace(s), however greater than two years of program operations anecdotally clarified the burden this complicated verification approach is causing consumers as a meaningful expense to the Marketplace.[14] There is significant literature demonstrating the burden the Deficit Reduction Act (DRA) of 2005 created by mandating Medicaid beneficiaries document citizenship status.[xlix,l] Research also underscores the administrative burden to public programs in terms of increased staffing costs and other administrative expenses associated with documentation mandates.[li] Studies show children denied Medicaid for failure to document citizenship status were most often US citizens and unfortunately lost coverage and went on to have meaningful gaps in health insurance, and ultimately poorer health outcomes.[lii] Anecdotally, the Marketplace has also noted the challenges of documenting citizenship status for certain consumers later found eligible.

Regarding income verification, studies suggest that programs using means tested methodologies, such as income verification, to identify eligible consumers experience trade-offs between access to services and program integrity and oversight. There is evidence from other public programs such as SNAP/school lunch programs, where introducing stricter rules requiring income documentation, did not reduce the rates

[14] Serco, Inc. is the eligibility support vendor contracted with CMS to perform multiple program functions in the Federally Facilitated Marketplace. Serco was awarded a base year contract in 2013 with four optional years valued at approximately $1.2 billion dollars in total. It is estimated that approximately 75 to 80 percent of these program costs are associated with adjudicating data matching issues, with income DMIs having the greatest volume.

of ineligible consumers receiving services, but did decrease access for those consumers who were indeed eligible.[liii] The Marketplace also shares a concern that subsidies are removed during DMI clock expiration for certain consumers who are indeed eligible, but fail to verify their income with successful documentation. According to current Marketplace rules, if the household successfully submits documentation of amounts not greater than 25 percent above their attestation or below 100 percent of the FPL (standards not aligned with eligibility for tax subsidies) the income DMI is considered resolved and the APTC and CSR levels remain unchanged. However, there are a number of reasons as to why documenting income can be challenging for certain consumers and households. Several of these reasons were already discussed such as income volatility and health literacy barriers preventing consumers from comprehending the income verification process and the documentation requirements. Consumers may also forget the attestation originally provided on the application and are unaware of the income number they are attempting to document. The Marketplace has also learned many consumers cannot document their income and guidance is needed to provide consumers successful examples of alternative written explanations. Self-employed consumers also tend to experience special challenges in documenting income. Lastly, while the 25 percent threshold employed in comparing documentation to attestation is a much more generous threshold than the 10 percent threshold used in comparing the attestation to available IRS or Equifax data, 25 percent can still be a very small margin of error for low-income consumers with variable wages. Research is ongoing at the Marketplace to study in more detail the extent in which consumers successfully submit documents in order to conduct additional analysis and study appropriate thresholds.

In summary, the income verification program in the Marketplace is designed to promote program integrity, provide consumers with the subsidies they are entitled to and protect the consumer from having an adverse experience at tax reconciliation time. However, for a high volume of Marketplace consumers the current process is reducing access to help in paying for coverage when little is known about the consumer's true eligibility for subsidies based on income. The income verification requirements,

including documentation submission, necessitated by law are likely to be required for the foreseeable future. Therefore, is increasingly important that the Marketplace gather more data about those consumers that struggle most with this complicated verification process. Improving data collection efforts and gaining the knowledge about which consumer segments are most vulnerable and at risk for income DMIs will improve the ability to target the Marketplace's education and outreach efforts. The next section discusses the dynamics of outreach and education in the Marketplace as these resources pertain to income verification.

Outreach and Education for Eligibility Assistance

The highlighted challenges of the income verification process in the Marketplace underscore the importance of targeted consumer outreach and education. Much of the aforementioned research discussed the importance of targeted education and outreach efforts in order to maximize eligibility and enrollment. Limited research is available specifically studying the outreach and education resources currently available to assist Marketplace consumers with the resolution of their DMIs. Nor is data available yet that directly measures the impact of the Marketplace's outreach efforts such as the outreach campaigns employing emails, calls, letters, etc. on the successful prevention and resolution of DMIs. The Marketplace is making important advancements in the area of data collection and it's anticipated that such data will be available in future plan years. Additionally, in 2015 the Marketplace took great strides to expand outreach and education efforts aimed at DMI improvement including adding improved application help tips, modals on HealthCare.gov and additional emphasis on the required SSNs in order to maximize income verification. Significant notices improvements included enhanced language taglines, providing more information to inform consumers about the requirements of documentation submission and how to most successfully resolve DMIs, enhancements made to outbound calling telephone scripts to educate consumers and strengthening partnerships with key stakeholder groups such as advocacy groups and

issuers. Moreover, in 2016 system enhancements such as the improved display of open income DMIs on the "Eligibility Results" home page at HealthCare.gov and the ability to re-use previously validated income data in income verification all hold significant promise.

Anecdotally, enough evidence is available to underscore that despite the millions of emails, phone calls and letters to consumers, the Marketplace is still facing a very high volume of consumers adversely impacted by income DMIs and more needs to be done. While limited research is available specifically on income verification and the ACA, there is literature on successful outreach and education efforts from other public programs germane to solving eligibility problems. Survey findings from the first two open enrollment periods on the resources offered by the combination of Marketplace Assistor Programs are also available and relevant to this endeavor.

Marketplace Assistor Programs, encompassing a number of programs including the Marketplace funded Navigators, Certified Application Counselors (CACs), programs operated by the Federally Qualified Health Centers (FQHCs), and the Federal Enrollment Assistance Program (FEAP), to name a few, are working to assist consumers apply and enroll in the affordability programs. These collective programs are referred to as "Assistor Programs." Note there are also state-licensed professionals who sell private health insurance, including Marketplace coverage, most often referred to as "Agents and Brokers".

The Kaiser Family Foundation publishes the annual Survey of Health Insurance Marketplace Assistor Programs and Brokers. According to the 2015 survey, during the second open enrollment period nearly 5,000 Assistor Programs provided assistance to applicants and helped an estimated six million consumers with the application and enrollment process.[liv] Assistor programs were also estimated to help well over a million consumers between open enrollment periods apply for coverage with SEPs and solve other post-enrollment problems. Between open enrollment periods is when most data matching occurs as consumers exhaust their 90-day window and thus it is likely Assistor Programs are spending notable resources helping consumers on verification issues related to DMIs, even if this survey does not explicitly call out

data matching. The survey reports over 80 percent of the Programs assisted consumers with questions regarding tax credits and subsidies, and approximately 62 percent of Programs assisted consumers with ACA tax-related questions. Over 50 percent of Programs reported assisting consumers because their coverage was terminated, and while the survey does not specify reasons for termination, it's a reasonable assumption that data matching is a root cause for a high volume of these consumers requiring help for reasons related to termination.

In 2015 CMS announced an additional $67 million in available funds for Navigator programs during the third open enrollment period. This announcement restored funding back to the original level awarded during the first open enrollment period and was welcome news for the Navigator programs. Increased efforts to educate these programs on how to help consumers with DMIs is critical for plan year 2016. The Marketplace has stepped up the effort to engage with these stakeholders through webinars and resource guides. Ultimately sharing the research produced from this project with the Marketplace, will help to identify resource gaps and target needed outreach and education to the most vulnerable populations most effectively.

Other research points to the importance of leveraging the existing expertise of community based organizations accustomed to assisting consumers with enrolling in public programs. The data suggests providing such community resources with timely access to consumer information paired with financial incentives are effective tools in promoting targeted outreach and enrollment strategies.[lv] Importantly the research suggests the network of community partners designed to help current and future enrollees are most successful if they have up to date access to eligibility and enrollment systems providing real-time access to important consumer data and current status. The inability for key stakeholder groups to access complete consumer records regarding data matching status is a known weakness of the Marketplace at this time. However, such data integration improvements are resource intensive and must carefully consider the safeguarding of consumer information.

Learning more about the Marketplace consumers with income DMIs is critical when implementing additional education and outreach efforts. Identifying key characteristics of at risk populations such as geographic location, age, sex, and language preference will only serve to refine the degree to which targeted interventions can be deployed. The importance of studying geographic location in order to target enrollment strategies and access to care is already well studied. It's also well known that uninsured rates differ dramatically geographically. Research suggests that nearly 50 percent of adults in Florida, Nevada, New Mexico and Texas experienced some period of time without insurance during 2009 and 2012, vs. less than 22 percent in Massachusetts and Vermont during the same period.[lvi] Geographic variability of consumers experiencing income DMIs is also likely to occur based on trends in enrollment and access to resources, and will be an important variable when considering targeting resources. It is an important component of this research *Framework*.

The importance of media messaging also cannot be ignored when considering improved outreach and education efforts, attention to variation in exposure to the media (for example by geographic location) may lead to differences in information provided to consumers nationally as well as differences in important dynamics such as a public sentiment and opinions of the ACA which may ultimately influence Marketplace enrollment.[lvii, lviii] One of the goals of the research here is to gain a better understanding of the geographic make-up of those at-risk consumers so we can design intervention strategies, such as the use of targeted media outlets, to assist a greater number of consumers. The next section discusses the background and available literature on part of the methodological approach employed in the study *Framework*.

Previous Analyses Using Cluster Analysis Methods in Public Health

The Marketplace Income Verification Data Analysis Framework is heavily focused on data collection and analysis efforts to learn more about Marketplace consumers faced with income data matching issues. The need to develop a specified data analysis "Framework" was identified by the CMS program lead as a

result of multiple competing data requests about consumers with income DMIs as an opportunity to apply more structure and organization to the approach of identifying, collecting, and analyzing data about consumers faced with income DMIs. The *Framework* builds upon the significant research and evidence-based literature emphasizing the importance of data-driven targeted outreach and education to assist Marketplace consumers, particularly low-income and other vulnerable populations, in understanding and accessing the new benefits and affordability programs offered under the ACA. Specifically, the Framework is focused on the descriptive statistics of the target population who are experiencing an adjustment for unresolved income data issues. It is also focused on techniques, such as data mining, aimed at facilitating a more in depth analysis of a very large data set to determine if meaningful groupings of consumers most at risk for adverse impacts as a result of income verification can be identified, and most importantly, predicted in future populations to inform improved interventions.

The cluster analysis data mining technique is the method used in Phase 2 of this study. Cluster analysis, or other similar techniques such as audience segmentation, are successfully used in a number of fields including the social sciences, commercial marketing and public health to identify meaningful population subgroups who are similar, across an established set of variables, for a given type of behavior or outcome.[lix, lx, lxi, lxii, lxiii]Segmentation techniques have been used in communication campaigns aimed at important public health outcomes such as health promotion and disease prevention to identify demographic and other factors for improved targeting and messaging based on the unique needs and attributes of the identified groups. As displayed in the *Framework*, the cluster analysis may also be used as a statistical approach in prediction modeling, to predict the occurrence of certain outcomes and to find structure in large, otherwise unorganized data sets, such as the current situation with the Marketplace income DMI data. The clustering algorithm employed in this study, referred to as Expectation Maximization (EM), is discussed in more detail in Chapter 3 (*Methods*). It is cited as the most effective approach (in comparison to other algorithms such as K-means), for successfully identifying relevant classifications of clusters.[lxiv]

While recent studies specifically using cluster analysis to inform targeted enrollment efforts among the uninsured were not identified, there is relevant research in the public health space addressing the effectiveness of the cluster techniques. In the nineties, segmentation techniques were used in the Texas Women, Infants and Children (WIC) program to target eligible, but unenrolled women. The goal was to formulate a social marketing plan capitalizing on knowledge of sociodemogrpahic characteristics and attitudes achieved via the segmentation research design (the CHAID analysis in this case). With limited funding, it was critical for the program to identify and design messages (in the form of TV spots) most likely to reach the unenrolled population. The effort specifically identified attributes of women in key demographic groups who did not understand the eligibility requirements or who had stigma concerns about the program (not dissimilar to the problems faced by the Marketplace regarding consumer attitudes). In this WIC program the information about the demographic composition of the population, and the use of the segmentation design, provided valuable information on how to allocate finite resources among multiple options for a statewide outreach and education campaign, ultimately establishing an effective and successful "consumer-driven" campaign.[lxv]

A 2009 study funded by the United States Department of Agriculture employed segmentation techniques to successfully establish a targeted social marketing campaign aimed at improving healthy weights among Americans. This research, which looked at both food and lifestyle behaviors associated with obesity, identified five clusters, including a "Highest Risk", "At Risk" and "Getting Better Results" cluster each with unique and distinguishing attributes. For example, 99 percent of the Highest Risk cluster were obese, demonstrated the least amount of exercise and watched the most amount of television. The "At Risk" cluster was associated with attributes such as most amount of time in front of computer and low probability of reading food labels, as compared to the "Getting Best Results" cluster in which all members were overweight, but every member read food labels and frequently made meals from "scratch." This study demonstrated through identification of distinct clusters, with unique attributes, that more effective social marketing techniques can be used, aimed at targeting specific behaviors associated with

the most at risk populations, based on evidence-based information. This study was one of the first to demonstrate how effective clustering techniques are used to improve public health outcomes, such as weight loss and obesity management.[lxvi]

The cluster analysis was also used in a 2009 study to organize and classify state Medicaid programs into distinguishable groups based on attributes associated with prescription drug expenditures in an effort to further understand how the outcomes of cost-containment strategies for drugs differ across programs. In this study factors such as sociodemographic status, severity of disease, FPL, education, percentage of state covered by Medicaid, access to care and policy relevant factors such as support for the publically funded programs emerged as distinguishing attributes among five identified clusters of Medicaid prescription drug benefit plans. The authors concluded that the use of cluster analysis was useful for state Medicaid programs by increasing the odds of program success through employing proven administrative interventions at potentially lower cost. Specifically, Roy and Madhavan suggest, "clusters will encourage practitioners and policy makers to think about issues in terms of groupings of related entities and their relationships, ran than individual states. Cluster-based policy could offer a comprehensive approach for understanding trends, as well as policy challenges and opportunities those trends present."[lxvii]

Another study compared multiple variables including demographic factors, health status and psychosocial factors as related to the promotion of physical activity. This study assessed the success of audience segmentation in establishing homogenous subgroups using simpler classification techniques such as only looking at one set of variables such as demographic factors, vs. looking at more complex classification models with a comprehensive set of predictors, including health status predictors, psychosocial predictors, or all predictors combined. Findings from this study suggest the use of "multivariable" approaches to classification algorithms, such as cluster analysis and audience segmentation, result in more optimal results (more homogenous subgroups) when factors such as health status and psychosocial factors are combined with more traditional demographic factors. This study emphasized the importance of

multivariable approaches in health communication and targeted intervention strategies, and for these reasons a multivariate approach, is included in the *Framework* of this research.[lxviii]

In summary, the data and analysis presented in the subsequent chapters of this research study will be an inaugural attempt to build from the current limitations of existing literature, using real consumer data on the Marketplace income verification process, specifically pertaining to income DMIs. Available research underscores the challenges of maximizing enrollment in means-tested public programs, such as the Marketplace, and offers robust discussions of the challenges of complicated eligibility criteria and verification, income volatility, low levels of health and financial literacy in low-income populations, limitations in current electronic data systems and the burdens of documentation requirements. Fortunately, the literature has also aided in identifying significant opportunities for improvements in the area of electronic data verification and targeted outreach and education based on successful efforts in other programs which will benefit this endeavor.

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Chapter 3 Marketplace Income Verification and the Affordable Care Act *Methods*

Study Goals and Objectives

The Marketplace Income Verification Data Analysis Framework was developed by CMS to address the high demand for additional information about the significant volume of Marketplace consumers facing income data matching issues (DMIs) and to establish a pathway toward a data driven intervention to improve targeted interventions to lead to greater income DMI issue resolution. The Framework lays out the problem statement and the following study objectives (previously summarized):

- Identify and create an appropriate data set by which to establish the baseline population of consumer households impacted by the income verification process for failure to resolve their DMIs;
- Establish a set of descriptive statistics which will identify the attributes of the consumer households in the data set;
- Collect and present data on the relationships between income DMIs and current Consumer Assistor Programs; and
- Use data mining techniques to investigate whether meaningful groupings of household consumers can be established among the large data set to better understand the impacted consumers and to see if we are able to identify the profile of consumers most at risk of losing all their APTC and CSRs for failure to resolve the DMIs.

By developing a baseline data set, collecting descriptive statistics and using data mining techniques, this research will achieve the following goals:

1. Provide the Marketplace, and eager stakeholders with much needed consumer data never collected and aggregated for this purpose to date;

2. Establish data for initial baseline measurement and for use for comparative purposes in future open enrollment periods;
3. Allow the Marketplace to start a conversation about what is actionable from the data collected for the consideration of resource allocation for both short term projects (for example pilot projects aimed at the most at risk consumers and notice improvement efforts) to the more medium and long term projects such as future allocation of assistor resources and policy changes.

Description of the source of study data

All the data collected for this study are Marketplace data analyzed for the first time for the purpose of this dissertation. Raw data were obtained from Marketplace records for the 2015 plan year for all households with an income data matching issue whose "clocks" were expired for failure to resolve the income DMI during the 2015 plan year. The data were scrubbed significantly to de-duplicate and confirm data accuracy by running multiple queries. The data collection period for 2015 ran from February 1st, 2015 through August 1st, 2015 to capture the high volume months of data matching activity in 2015 and to allow time for data analysis. Specifically, the data collected and analyzed in this study are drawn from three Marketplace sources including: 1) application data stored in the federal Marketplace (FFM) database; 2) data collected and stored with the eligibility support vendor, Serco; and 3) additional data sources originally captured in the FFM, but queried from HealthCare.gov support system and vendor, Midas, and then also sent in a weekly file to Serco. The final database established for this research study is stored with the Marketplace vendor, Serco. A data file was also made available which provided the breakdown of Consumer Assistor resources by county; specifically the file lists all consumer Assistor Programs completing the 2015 CMS assistor training.
In summary, the data are largely comprised of consumer responses on the application, actions taken by the FFM regarding DMI process (i.e. adjustments made for failure to resolve DMIs) and program information provided by CMS.

Study Design and Analytic Methods

Study Population:

The data collected for this study includes all 2015 Marketplace households where an income DMI was generated during the 2015 plan year and who subsequently experienced an adjustment/clock expiration of their APTC/CSRs for failure to resolve their data issue in a timely manner. The consumer households are all from the federal Marketplace; the data set does not include any SBM data. These households experienced an adjustment to their annual income in the time period starting in February 2015, through August, 2015, with March 1st through August 1st, 2015 respective effective dates (respective effective dates refer to the first date of the following month that the new APTC/CSR amount is applied). These time periods reflect the heaviest volume of adjustments for consumers with data matching issues in the 2015 plan year. The data set includes all consumers who met the above criteria, not just a sample of households identified from a larger data set. For a study with a population sample of this size, there is only a limited amount of missing data, and where data is missing it is most often associated with optional questions on the application for which consumers did not respond. Worth noting in the selection of the study population was the lack of available data accessible for this project on the general Marketplace population without DMIs that would have been useful for comparison purposes. Additionally, to make the scale of this project reasonable and to directly address the most immediate needs of the program, the approach concentrated on building a validated data set on those consumers who *did not resolve* their data matching issue. An important next step would be to collect additional data on those consumers who *did resolve* their DMIs in order to draw comparisons across the differing populations. However secondary to data constraints and the desire to expend the limited resources on the primary problem statement of the high volume of unresolved data matching issues and the need to identify who these consumers are and how to flag at risk consumers, this project did not draw comparisons across the unresolved and resolved population at this time; such an approach is certainly one option for a logical next line of inquiry.

Data Cleaning/Creation of the Data Set:

All the data used in the collective components of this study were ingested into Marketplace databases held with the eligibility support vendor, Serco. For the consumer descriptive statistics component, records were de-duplicated by a series of unique identifiers (for example, application ID and person tracking number (PTN)). Considerable pass back of the data occurred among the vendors and the FFM to test the accuracy of the data stored in the FFM, for example, the correct generation of a data matching issues at application submission and to confirm actions within the FFM (such as resolution and adjustment) taken by the eligibility support workforce. For this inaugural effort, there were multiple methods by which the data could have been generated for this study, to maximize data integrity, only records and actions confirmed across both the FFM and the ES vendor were counted, and these records are considered "confirmed transactions." Considerable effort was taken to pull data from multiple data sources, scrub the data by comparing records across multiple data bases and establishing mutually agreed upon business rules for the treatment of data elements and ultimately to assure accuracy for this research. All of the data used in this study is stored on the closed and secure network of CMS FFM vendors and all of the displayed data are summarized, aggregated data, no personally identifiable data (PII) was shared for the purposes of the study.

Creation of Variables:

Attributes were established for both the descriptive statistics and the cluster analysis. The following tables outline the approach to variable development.

Table 3: Descriptive Statistics, Variable Definition and Source

Type	Name	Description/ Classification Labels	Definition	Measurement	Source
Demographic	Gender	Male/Female/Missing	Gender is of the primary application point of contact (POC), usually the tax filer	# / %	Midas Weekly File

	Age	Continuous Data Element/Missing	Attained age is taken from the POC/tax filer	#	Midas Weekly File, then calculated from DOB
	Age Bucket	Child, Young Adult, Adult, Protected, Medicare Aged/Missing	Child: Under the attained age of 18 Young Adult: Attained age 18 to 24 Adult: Attained age 25 to 44 Protected: Attained age 45 to 64 Medicare Age: Attained age 65 and above Missing: Age/Date of Birth unavailable	# / %	Age groupings as defined by the U.S. Census Bureau
	Race	American Indian or Alaska Native, Asian Indian, Black or African American, Chinese, Filipino/Philipino, Guamanian or Chamorro/Quamanian or Chamorro, Japanese, Korean, Native Hawaiian, Other Asian, Other Pacific Islander, Other Race, Samoan, Vietnamese, White, or Missing	Values are derived from self-selection question on Health Insurance Marketplace application. The race used is that of the POC/tax filer. *Selection of race/ethnicity is optional on the Marketplace application*	# / %	Midas weekly file, Race determined by U.S. Office of Management and Budget guidelines
	Region	Mid-Atlantic, Midwest, Northeast, Northwest, Southeast, Southwest, Missing	State selection of the POC/tax filer of the application Mid-Atlantic: DC, MD, NC, PA, VA, WV Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD,	# / %	Midas Weekly File

			WI Northeast: CT, DE, MA, ME, NH, NJ, NY, RI, VT Northwest: AK, CO, ID, MT, OR, UT, WA, WY Southeast: AL, AR, FL, GA, KY, LA, MS, SC, TN Southwest: AZ, CA, HI, MV, NV, OK, TX		
Household Composition and Application Family size	HH Composition	Single Adult HH Multiple person HH Missing	Identifies the type of family model seeking coverage.	# / %	Midas Weekly file
	Application Family Size	Single, Couple, Family, Large Family, Missing	Based on number of application members seeking coverage Single: 1 member Couple: 2 members Family: 3 to 5 members Large Family: Over 5 members	# / %	ES/Serco data sets groupings
Consumer Preference	Language	Arabic, Chinese, English, French, French Creole, German, Gujarati, Hindi, Korean, Other, Polish, Portuguese, Spanish, Tagalog, Urdu, Vietnamese and Missing	Language preference of the POC/Tax Filer; language preference is provided for both spoken and written preference	# / %	Midas Weekly File
	Email	Yes, No, Missing	Contact preference included on the application and is available in the Midas database	# / %	Midas Weekly File
Consumer Household APTC-related	Amount of Applied APTC	Continuous Data Element/Missing	Maximum APTC amount for the HH	#, mean reported with standard deviation	Returned Midas file initiated by ES/Serco

Variables					Finder File
	Applied APTC Bucket	Classification of APTC amounts using four values, the dollar range is derived from the distribution of the APTC amounts	High APTC: amounts of $750/month and above per HH Median APTC: amounts of $250 /month through $750 per HH Low APTC: amounts under $250/month, but above $0/month No APTC: no APTC assistance received Missing: No values returned for APTC in the Midas finder file	# / %	Returned Midas file initiated by Serco/ES Finder File
	Lost all APTC	HH lost APTC at adjustment	Lost APTC: lost all APTC at adjustment Retained APTC: lost none or only part of APTC at adjustment Missing: data not available, HH either did not receive APTC or have non positive/negative values	# / %	Returned Midas file initiated by Serco/ES Finder File
Enrollment Status	Enrollment Status at Expiration	Yes, No, Missing	Indicates whether anyone in the HH was enrolled at the time of adjustment. If enrollment field is null at adjustment, the HH is not considered enrolled	# / %	Weekly Midas File
	Current Enrollment status as of end of OE 2.0	Currently Enrolled Not Current Enrolled Missing	Indicates whether anyone in the HH is currently enrolled as of 10.31.15	# / %	Weekly Midas File
Other	Radio Silent			# / %	ES/Serco Database

Types of Analysis:

The study analysis consists of two Phases. Phase 1 includes the data collection, display and analysis of the primary demographic variables outlined above, the geographic display of the DMIs described in the data set and finally analysis and discussion of the available assistor resources aligned with the consumer DMIs in the established data set. Phase 2 uses the same data set and employs a data mining technique referred to as cluster analysis to determine if meaningful groupings can be identified within the large data set to both learn more about the data and to build predictive modeling to identify households at "high risk" for future APTC adjustment and loss of premium assistance. Both efforts are described in additional detail below.

Phase 1: Descriptive Statistics:

This research represents the first large scale data collection effort to analyze consumers who lost APTC as a result of the income verification process. As discussed, the income verification process impacts millions of Marketplace consumers on an annual basis and thus it is imperative that the Marketplaces learn more about these consumers and take action to allocate resources accordingly to improve the verification process and provide Marketplace consumers the correct level of subsidies based on sound eligibility criteria. As virtually no data have been collected and analyzed to date for this purpose, it was important to start with the basics and to establish a baseline data set, identify the available variables, establish business rules, attribute definitions, and define data collection efforts. Once the inaugural data set was established, there are multiple uses for the analysis of the descriptive statistics including Marketplace education, resource allocation, measurement and metrics and targeted outreach. Specifically, the analysis plan for the descriptive statistics component includes the following:

Part 1: Summary statistics for the study population organized by variable type

Part 2: Geographic representation of the following:

a. All income DMIs generated for the study time period in 2015 by state;
b. Consumer households adjusted for failure to resolve their income DMI; and

c. Established ratio of income DMI adjustments per DMI generated, by state.

Part 3: Summary Statistics by State/County of Marketplace Assistor resources compared to income DMI generation and APTC adjustments for the study population.

Phase 2: Cluster Analysis

One of the primary objectives of this study is to learn more about the Marketplace consumers who are losing APTC as a result of income verification and to examine if meaningful groupings of consumers can be established based on their shared characteristics in order to improve the Marketplace's coordinated and targeted interventions, such as outreach and technical assistance. The goal of the cluster analysis is to identify the attributes of consumers most likely to lose all their APTC when adjusted to determine if there are opportunities to build predictive models to flag and identify consumers with similar risk profiles in future cohorts who are at "high risk" of losing all APTC/CSRs.

Data mining is a useful approach when there is little known about the population profile of a data set, specifically data mining can be used to extract patterns about a population, generate statistical summaries of key attributes of the population, and develop data models that are relevant to the population which can later be used to make predictions about future populations. Data mining is a key component of the research *Framework* presented here because the data set is very large, little is known about the population characteristics of those who are experiencing these adverse adjustments to their APTC, and thus the Marketplaces ability to target key interventions is limited to date.

As discussed in Chapter Two, cluster analysis is one approach to data mining that has long been used in other fields, such as marketing, political campaigns, and to some extent medicine by way of symptom classification. Cluster analysis is able to identify meaningful segments or groupings in a data set, based on similar attributes that allow for a high volume of information to be organized in a way that facilitates comprehension and analysis. The organization of the data and identification of groupings of data points with similar attributes,

such as high risk consumers, facilitates coordinated outreach and marketing campaigns that can more easily target consumers who meet the attributes of the at risk populations.

The Cluster analysis was performed using Microsoft (MS) SQL Server Analysis Services 2012. The entire data set in the defined baseline population used for the descriptive statistics was included in the cluster analysis (~1.4 million households), with no households omitted from the data set. The MS clustering algorithm offers two approaches for developing clusters and then assigning the data points to the clusters, K-means and Expectation Maximization (EM); for MS the default method is EM. EM is used here for a number of reasons. First, unlike K-means, where each data point can belong to only one cluster, in EM each attribute associated with each record is assigned a probability of belonging to each specific cluster and cluster membership is the sum of all the partial memberships within a cluster. For example, consider the value of "*single*" for the attribute *family size*; if the EM model determines that the value of single, for the family size attribute has a probability of 1.0 for belonging to cluster 1, this means that every data point (or consumer record) in cluster 1 will be of single person consumer households. Consider that the attribute *currently enrolled* with a value of "*yes, currently enrolled*" has a probability of .51 of belonging to cluster 1, this means approximately half of the records in cluster 1 will be of consumer households current enrolled. The final cluster size is defined by adding the total probabilities of all the data points supporting a particular cluster. This approach of defined probability of cluster membership is ideal for modeling large data sets with multiple attributes where it cannot be reasonably assumed that each record, of millions of records, can be neatly organized into only one particular cluster. Importantly, EM is also the preferred clustering approach when working with discrete variables such as those that predominate in this analysis and lastly, as a modeling tool for use in very large data sets EM is known to outperform other clustering approaches.[lxix]

In the EM methodology, an algorithm through multiple iterations of the data defines an initial cluster model that best fits the data set and then determines the probability a given data point will belong to a certain cluster via additional iterations. This algorithm keeps repeating until there is a best fit of the probabilistic model and

the data, including reseeding data points to previous clusters, if the algorithm and model generate clusters with no data or limited data. In EM clustering, log-likelihood is the function used to determine best fit of the data with the model.[lxx] Again, in EM, the final results of the model are all probabilistic. Essentially, every data point in the data set has a different probability of belonging to each cluster, with data points overlapping clusters. Therefore, unlike other clustering methods such as K-means, the sum of all items in the clusters can exceed the total number of data points. However, in the MS SQL Analysis the final summary scores are adjusted to account for this. Lastly, non-scalable EM was used as the seed to build the model, which essentially means the entire data set was used to build the model, rather than an initial seed of, for example, only 100,000 records.

The Cluster Analysis was completed in two phases. Phase 1 determined if meaningful clusters could be established based on the large dataset and if so whether the number of clusters and the associated characteristics of each cluster could be defined. Phase 2, consists of the Probability Model, in which each cluster was analyzed to determine if "high risks" clusters could be identified. For the purposes of this study, "high risk" was defined as consumers losing all of their APTC when adjusted for failure to resolve their data matching issue. If via the cluster analyses prediction model "high risk" consumers could be identified, this predictive model could then be applied to future households generating income DMIs, for example during the 2016 plan year, and these consumers can be flagged immediately for additional intervention.

One challenge with the analysis approach is that in order to build a predictive model for future populations which would allow the Marketplace to immediately intervene directly after a DMI is generated, the model must be built with only those attributes or characteristics knowable upfront at initial DMI generation, and not based on attributes occurring later in the 90-day data matching life cycle. For example, the goal is to identify at risk households upfront based on characteristics knowable at application submission, such as size of the household, age of primary applicant and geographic location, and not attributes or behaviors manifesting later in the process, such as whether the household responded to outreach notices, whether they remained enrolled or how much APTC was lost at adjustment. The latter variables here are called "lag variables" because they

lag behind the variables available at the time of application submission and such variables must be removed from the Predictive Model in order to achieve the primary objective of upfront identification of "high risk" consumers. Therefore, in phase 2 of the cluster analysis the cluster algorithm must be tested without the lag variables to determine if "high risk clusters" can still be identified.

Table 4 displays the attributes and structure of the cluster model. Note all of the model variables are discrete (again ideal for the EM method) and in most cases the descriptions in Table 4 align with the descriptions used in the Descriptive Statistics variables for Part 1 of this analysis.

Table 4: Structure and Definitions of the Variables Used in the Cluster Analysis Modeling

Attribute Name	Description
App Family Size	One of five values derived from App Family Count. They are Single, Couple, Family (3 to 5), Large Family (over 5) and Missing
Application ID	App ID in MIDAS file
Applied APTC	Maximum APTC amount
App Submission Count	Number of distinct applications submitted by a HH
App Submission Size	One of five values derived from App Submission Count. They are Single, Double, Triple, Multiple (over 3) and Missing
APTC Bucket	Classification of APTC amount using five values: High APTC, Medium APTC, Low APTC, No APTC and Missing. The dollar range was derived from the distribution of the APTC amounts and are: High APTC is for amounts of 750 or above. Medium APTC is 250 or above but less than 750 while under 250 is Low APTC. The zero amount is considered No APTC.
APTC Member	If a positive amount was provided in the APTC files then 1 is assigned else it is 0
Attained Age	Age provided by MIDAS
County	This is derived from matching by 5 digit zip code
Currently Enrolled	Enrollment status as defined on 10.31.15
Currently Enrolled Txt	One of three values derived from Currently Enrolled: currentlyEnrolled (1), notCurrentlyEnrolled (0) and missing

Gender	Gender associated with primary POC/tax filer. It is Male, Female or missing.
Inconsistency Type	Single value: Annual income
Is Elder	Identifies the record as having an elder
Is Elder Txt	There are three possible values derived from Is Elder, either Elder or no Elder
Is Enrolled	Indicates if the participant was enrolled at the time of income adjustment. 1 is yes otherwise it is 0.
Is Enrolled Txt	Derived from Is Enrolled. It is one of three values: isEnrolled, notEnrolled and missing.
Lost APTC	If the consumer HH had a APTC and now it is 0 then it is lost. If APTC remains on application, then it is retained. Otherwise it is missing.
Lost APTC Txt	One of three values derived from Lost APTC and aptcMember. If aptcMember is 1 then the value derived from lostAPTC is used unless it is classified as missing. The three possible values are: lostAPTC, retainAPTC and missing.
Month Adjusted	Year and Month of APTC adjusted: 2015-2 to 2015-07 inclusively
Person Tracking Number	Tracking Number for MIDAS, used to assign HHs primary ID
Prefer Email	If valid email and email is preference then Y, if email is not a preference then N, else missing.
Race Name	Value provided by MIDAS
Radio Silent	If an annual income associated document type was found for the application then N, else Y
Rcd ID	ES/SERCO generated identifier assigned to the associated Audit 005 record to confirm actions
Spoken Language	Preferred spoken language of the applicant provided by MIDAS
US Region	States assigned to the regions are: Mid-Atlantic AE, DC, MD, NC, PA, VA, WV Midwest IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI Northeast CT, DE, MA, ME, NH, NJ, NY, RI, VT Northwest AK, CO, ID, MT, OR, UT, WA, WY Southeast AL, AR, FL, GA, KY, LA, MS, SC, TN Southwest AP, AZ, CA, HI, NM, NV, OK, TX
US State	State identified with the DMI
Written Language	Preferred written language of the applicant provided by MIDAS

Zip Code	Zip code provided by MIDAS

Table 5 displays the variables used in the Predictive Model, as well as highlights the removed lag variables; in this analysis the lag values are set to "null" so as not to influence the assignment of a given data point to a particular cluster in the Prediction Model.

Table 5: Prediction Model Structure

Attribute Name	**Model Usage**	**Lag Variable originally used in Model but removed for Prediction**
Ad Adult	Predict	
Ad Gender	Predict	
Age Bucket	Predict	
App Family Size	Predict	
App Submission Size	Predict	
APTC Member	Predict	
APTC Bucket	Predict	
Currently Enrolled	Input	Yes
Gender	Predict	
Elder	Predict	
Is Enrolled	Predict	
Lost APTC	Input	Yes
Month Adjusted	Input	Yes
Prefer Email	Predict	
Race	Predict	
Radio Silent	Input	Yes
Record ID	Predict	

US Region	Predict	
Written Language	Predict	

In summary, the goal of this two phased analysis plan was to establish, for the first time, critical baseline data about this large population of consumers experiencing an adjustment to their levels of APTC secondary to a failure to verify their income in a timely manner. The goal is to grow Marketplace knowledge about the impacted consumers, establish metrics to be used for future measurement, use data to assess the current allocated resources and the need to target limited resources in a more informed way. This initial analytical approach is an important first step in building the knowledge and sophistication of the Marketplaces, specifically around income verification, which will ultimately lead to an improved consumer experience and higher enrollments. The results of this analysis plan are discussed in Chapter Four.

IV. Human Subject Issues

On November 11, 2015 the Institutional Review Board Office determined upon review of the submitted IRB Office Determination Request Form for the dissertation entitled *Income Verification and the Affordable Care Act,* that the research is not human subjects research.

[lxix] Microsoft Clustering Algorithm Technical Reference, SQL Server 2016

[lxx] Microsoft Clustering Algorithm Technical Reference, SQL Server 2016

Chapter 4 Marketplace Income Verification Study Results

Phase 1, Part 1: Population Descriptive Statistics Results

Phase 1 of the Marketplace Income Verification Data Analysis Framework calls for the evaluation of data for 1.434 million consumer households subject to the inconsistency expiration process (also referred to as a data matching adjustment) for failure to resolve their income DMI.[15] All expirations for households in the data set occurred between February and July 2015, with respective effective dates of March 1st through August 1st, 2015. The data includes all consumers subject to an income DMI expiration, without regard to enrollment status as the current policy requires action to update the Marketplace application when the 90-day inconsistency clock expires, regardless of current enrollment. Where the data and analytical capabilities exist, the data were then stratified by enrollment status. The results of this inaugural effort to collect descriptive statistics on the 2015 Marketplace population with income DMIs are displayed below in the following tables.

Table 5: Demographic Variables

Variable	Variable Descriptor	Summary Statistics n=1,434,022; (% of n), unless otherwise noted
Gender:	Gender is of the primary application point of contact (POC), usually the tax filer	
Female		741,820 (51.7)
Male		683,990 (47.7)
Missing Data		8,212 (0.6)
	The attained age is taken from the POC/tax filer of the	Min: 0

[15] The terms "consumers" and "households" are interchangeable throughout this analysis. Income DMIs are generated, resolved and adjudicated at the household level.

Attained Age:	applicant.	Max: 108 Mean: 45 (STD: 13) Median: 47 Mode: 63
Age Bucket:	The attained age of the POC/tax filer of the applicant. Applicant's age classified by a label: Children, Young Adult, Adult, Protected, Medicare Age and Missing.	
Children	Under the attained age of 18	7,358 (0.5)
Young Adult	Attained age 18 to 24	73,727 (5.1)
Adult	Attained age 25 to 44	564,358 (39.4)
Protected	Attained age 45 to 64	767,024 (53.5)
Senior/Medicare-Age	Attained age 65 and above	20,599 (1.4)
Missing	Age/Date of Birth unavailable	956 (0.1)
Race[16], [17]:	Values are derived from self-selection question on Health Insurance Marketplace application. The race used is that of the POC/tax filer.	
American Indian or Alaska Native		4,478 (0.3)
Asian Indian		10,307 (0.7)
Black or African American		154,162 (10.8)
Chinese		6,208 (0.4)
Filipino/Philipino		3,149 (0.3)
Guamarnian or Chamorro/Quamanian		148 (0.0)

[16] Race was an optional question on the 2015 Health Insurance Marketplace Application for Health Coverage. The question states: "Optional: (Fill in all that apply) Race:" and lists all the choices indicated per above as well as provides an option for other with free text input.

[17] Note on the Marketplace application Hispanic or Latino/a origin is not considered separately. There are optional fields for ethnicity where consumers may select values for Hispanic or Latino/a ethnicities, however these fields were overwhelmingly null in the available data.

or Chamorro		
Japanese		876 (0.1)
Korean		4218 (0.3)
Native Hawaiian		347 (0.0)
Other Asian		6810 (0.5)
Other Pacific Islander		610 (0.0)
Other Race		4 (0.0)
Samoan		73 (0.0)
Vietnamese		10,607 (0.7)
White		492,229 (34.3)
Missing		739,805 (51.6)
Region:		
Mid-Atlantic	AE, DC, MD, NC, PA, VA, WV	215,842 (15.1)
Midwest	IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI	251,161 (17.5)
Northeast	CT, DE, MA, ME, NH, NJ, NY, RI, VT	55,015 (3.8)
Northwest	AK, CO, ID, MT, OR, UT, WA, WY	49,795 (3.5)
Southeast	AL, AR, FL, GA, KY, LA, MS, SC, TN	609,186 (42.5)
Southwest	AP, AZ, CA, HI, NM, NV, OK, TX	253,023 (17.6)
Missing		0 (0)

Demographic Variable Discussion

In the study population (n=1,434,022), females (as defined as primary point of contact, POC,) outnumber male applicants 52 percent vs. 48 percent with very little missing data (less than 1 percent). The mean attained

age is 45, with approximately 54 percent of the population falling between the ages of 45 and 64. The modal age is 63 (n=43,041). Not surprising for the Marketplace consumer demographic, 93 percent of the population is between the ages of 25 to 64, with less than 0.1 missing data. Race/ethnicity is an optional question on the Marketplace application and data are missing for approximately 52 percent of the population. Of the available data, households where the primary POC is white represent 34 percent of the population and approximately 11 percent represent Black or African American households. The high volume of missing data challenges the ability to draw meaningful conclusions on race.

Regarding geographic variation, the highest volume of DMI expirations are in the southeastern part of the U.S. with 43 percent of all income DMI adjustments nationwide. The June 30th 2015 Effectuated Enrollment Snapshot provides an approximation for comparison purposes to overall Marketplace enrollment. In the snapshot, for HealthCare.gov states in the southeast (essentially excluding Kentucky) effectuated enrollment accounted for 36 percent of all HealthCare.gov consumers receiving APTC nationwide and 34.4 percent without regard to financial assistance.[lxxi] Comparing the snapshot to the study population is not a precise comparison; the snapshot is a point in time count of consumers currently enrolled with effectuated premium payments, while the study data are counting all households with income DMIs expired during the study period. However, this initial comparison is useful for preliminary analysis of the scale of DMI generation in the southeast. Phase 1, Part II, Population Geographic Results, offers a more detailed discussion of income data matching activity by state and county.

Table Six: Household Composition and Application Family Size Descriptive Variables

Variable	Variable Descriptor	Summary Statistics n=1,434,022; n(%)
Household Composition:	Identifies the application household composition type of those seeking coverage	
Single adult household		743,202 (51.8)

Multiple person household		690,820 (48.2)
Missing Data		0 (0)
Application Family Size:	Derived from family member attributes and assigns classification at the household level.	
Single	1 member	690,820 (48.2)
Couple	2 members	491,443 (34.3)
Family	3 to 5 members	242,407 (16.9)
Large Family	Over 5 members	9,352 (0.7)
Missing Data		0 (0)

Household Composition and Application Family Size Discussion

The data are complete for the household composition and family size variables. Single applicants represent just under half of the study population. Couple, or two member households, account for 34.3 percent of the population and applications where 3 to 5 members are seeking coverage is approximately 17 percent. Household composition, such as application family size, is important to the Marketplace data matching effort as household dynamics influence outreach and education efforts. For example, in outreach letters and outbound calling scripts it's optimal for the eligibility support workforce to understand if the communication, and request for household documentation, is best directed toward single or multiple person households. Household composition is equally important for the workforce when employing job aids to calculate combined household income. These data also inform the allocation of workforce resources. For example, less resources are required to analyze income documents and calculate household income for a single person household than for households that include 2, 3 or as many as 5 or more members, where multiple documents are analyzed and entered into job aid(s) to achieve the accurate

total documented household income. Additional workforce resources and training are required to handle multiple person households, and access to data informs these resource-intensive operational decisions.

Table Seven: Consumer Household Preference Variables

Variable	Variable Descriptor	Summary Statistics n=1,434,022; (%)
Language Preference:	The language preference used is that of the POC/tax filer.	Spoken / Written
Arabic		0.0% / 0.0%
Chinese		0.2% / 0.2%
English		90.0% / 90.3%
French		0.0% / 0.0%
French Creole		0.1% / 0.1%
German		0.0% / 0.0%
Gujarati		0.0% / 0.0%
Hindi		0.0% / 0.0%
Korean		0.1% / 0.1%
Other		0.1% / 0.1%
Polish		0.0% / 0.0%
Portuguese		0.1% / 0.0%
Russian		0.0% / 0.0%
Spanish		8.3% / 8.1%
Tagalog		0.0% / 0.0%
Urdu		0.0% / 0.0%
Vietnamese		0.4% / 0.4%
Missing		0.7% / 0.7%

Prefer Email:	Email preference is that of the POC/tax filer of the applicant	N (%)
Yes	Email is indicated to be the preferred method of contact and an email address is present in the consumer record	357,647 (25)
No	Email is not the preferred method of contact	22,172 (1.5)
Missing	No contact preference was indicated or email preference was selected but no email address was provided	1,054,203 (73.5)

Household Preference Discussion

English dominated both the spoken and written language preference at 90 percent, Spanish preference is 8.3 and 8.1 percent spoken and written respectively with data missing in less than 1 percent of cases. Such data are critically important to the Marketplace data matching effort as a tremendous amount of scrutiny is placed on the Marketplace's ability to effectively notify and reach non-English speaking consumers. These data are important when considering resource allocation for translation services, among other resources designed to assist non-English speaking consumers.

An alarmingly high volume of data is missing regarding email preference, particularly for a program experiencing a high rate of consumers applying via the HealthCare.gov website which requires a verified email address to submit an online application. The high volume of missing emails is also concerning as one of the central focal points of the consumer outreach campaign is email notification to warn consumers of their DMI and timeframe to submit required documentation. Further analysis is required to determine if the large volume of missing email data is a limitation of the database the eligibility support program accesses when examining matches with consumers who have DMIs, or is a larger issue with the way the Marketplace is collecting and storing emails from the application submission process. The above data have already proven actionable and the Marketplace is researching the approach by which emails are

collected from the application and stored in the collective Marketplace databases in an effort to increase the successful capture of emails for DMI outreach in 2016.

Table Eight: Consumer Household APTC-related Variables

Variable	Variable Descriptor	Summary Statistics n=1,434,022; n(%), unless otherwise noted
Amount of Applied APTC	The *applied* APTC received per month per policy/household.[18]	Min: $0 Max: $32,536 Mean: $1,410 (STD: $1,226) Median: $1,064 Mode: $0 non-zero Mode: $600
Applied APTC Bucket	Classification of APTC amount using four values: High APTC, Medium APTC, Low APTC and Missing. The dollar range was derived from the distribution of the APTC amounts. These classifications were created based upon the distribution seen in the population.	
High APTC	Amounts $750/month and above per household	753,95 (52.6)
Medium APTC	Amounts $250/month or above but less than $750/month	283,131 (19.7)
Low APTC	Amounts under $250/month or below but above $0/month	118,075 (8.2)
No APTC	No APTC Selected	225,645 (15.4)
Missing	No values were returned for APTC/no data available	53,216 (3.7)
APTC Status	Indicator that the Household lost all APTC at adjustment. The values for lost all APTC are only for households that have received APTC at one time and eventually lost all financial assistance.	

[18] The applied APTC is the amount of APTC the household elected to receive per month based on their total eligible APTC amount. Households may be eligible for more APTC then they elect to apply toward a monthly premium.

LostAPTC	The members of the household lost all APTC	560,432 (39.1)
RetainAPTC	The members of the household retained some (not necessarily all) APTC	594,729 (41.5)
Missing	The households either did not receive APTC or have missing values	278,861 (19.4)

Discussion of APTC Related Variables

The mean applied APTC received per month per household was $1,410. The study results demonstrate outliers in the data as shown by the maximum APTC of $32,000. When outliers emerge the results are shared with the Marketplace for further research. Analysis is underway to verify such outliers and to understand the extent by which such outliers influence the data, such as mean APTC. Certain households have $0 applied APTC (~225K for this sample) which likely represents a large portion of unenrolled consumers, among other reasons consumers elect not to apply APTC toward a monthly premium. For the majority of consumers electing to receive APTC, $600 is the mode. For the study population, just over half (53 percent) received "high APTC" with amounts of $750 and above applied to pay a monthly premium.

As a proxy to the general FFM Marketplace population without regard to DMIs, the June 30th Effectuated Enrollment Snapshot reported average monthly APTC of approximately $271 for enrolled consumers in HealthCare.gov states, noting a higher average APTC in Alaska of $534 per month and a low of approximately $159 per month in Arizona.[19,lxxii]. While the time periods of both the study population and the snapshot largely overlap, the populations are not precisely the same. The snapshot is reporting average APTC on point in time effectuated enrollments for consumers with active policies vs. the DMI study population which is following a cohort of households with income DMIs generated during the defined study period, regardless of enrollment status. The study data are also reporting applied APTC at the

[19] APTC amounts also vary by the cost of the second lowest cost silver plan available in the region, in addition to household income.

household level where the snapshot is reporting APTC/CSRs on individual effectuated enrollments which may cause differences in the data. The snapshot is also using data based on the interim payment process and issuers' estimates of APTC amounts owed to the issuer for effectuated enrollments, while the study data are querying household applied APTC amounts directly from the Marketplace databases, as available. CMS validates payments to the issuers based on their estimates and there is significant work by both issuers and CMS to reconcile payment data to handle monthly enrollee fluctuations such as cancelations, and terminations. Secondary to the inconsistency clocks associated with income DMIs and the statutory requirements, CMS takes monthly DMI action to adjust APTC in the early part of each month and the issuers are required to process these income DMI transactions with all their other transactions. It's often possible at the time the Marketplace takes action to expire an income DMI, the full reconciliation process between an issuer and the Marketplace has not completed. Different teams within CMS administer the eligibility support data matching portfolio and report the effectuated enrollment snapshot. Coordination and collaboration is ongoing to make certain consistent assumptions and methodologies in reporting data, such as average APTC amount, are used, particularly as consumer data are shared among a number of databases. Additional analytics and data sharing is ongoing at the present time to further analyze the APTC amounts for consumers with DMI issues reported here, as compared to the general Marketplace population, to answer important questions such as whether consumers with income DMIs receive higher amounts of APTC on average. Assuring the data matching program within the Marketplace has optimal access to APTC data and the most updated enrollment data (as possible with the full reconciliation process) is an ongoing effort with significant progress made in 2015.

One of the most critical data points in this study is displayed in this section which is the number of consumer households losing all of their APTC for failure to resolve their income DMI. According to the data, of those households receiving financial assistance, 39 percent of the entire study population lost all of their advanced premium assistance at clock expiration. Additional analysis was completed to stratify this figure by enrollment status and determined that 51 percent of the *enrolled* study population lost all

APTC for failure to resolve the income DMI. This figure represents over a half a million people losing all APTC/CSRs for plan year 2015. Approximately 42 percent of the study population retained some amount of APTC after adjustment. Future data collection efforts and research will strive to break this figure down into additional detail to determine the amounts of APTC lost in a more granular level of detail.

Table Nine: Consumer Households Enrollment status

Variable	Variable Descriptor	Summary Statistics n=1,434,022; n(%)
Enrollment at Adjustment:	Indicates whether anyone in the household was enrolled at the time of the adjustment	
Yes		1,059,629 (73.9)
No		374,39 (26.1)
Missing		0 (0)
Currently Enrolled:	Indicates whether anyone in the household is currently enrolled. Currently enrolled is defined as enrolled as of November 1, 2015.	
Currently Enrolled		658,199 (45.9)
Not Currently Enrolled		5775,823 (54.1)
Missing		0 (0)

Discussion of Enrollment Variables

Approximately 74 percent of the consumers in the study population were enrolled at the time of their adjustment resulting in a reduction or complete elimination of their monthly APTC and CSRs. When the data were refreshed in November 2015 for the same population, only 54.1 percent of the population was

enrolled, reflecting approximately a 20 percent decrease in enrolled consumers. This reduction is significant and it's reasonable to assume that a loss of access to financial assistance will lead to subsequent loss of enrollment status. However, a number of other factors also influence enrollment status, such as marriage, divorce, gaining access to employer sponsored coverage and changing and dropping coverage for other reasons.

The ability to establish an accurate method for measuring point in time enrollment status' of consumers impacted by the DMI process was a critical part of this endeavor and is an effort that is ongoing with significant improvements seen in 2015. Ongoing coordination among Marketplace teams to accurately capture the influence of the data matching program on enrollment status is a must. For 2016, additional data are planned for collection and analysis in an effort to learn more about the influence of income DMI activity on enrollment.

Table Ten: "Other Variable" Category

Variable	**Variable Descriptor**	**Summary Statistics n=1,434,022; n (%)**
Number of Applications Submitted	One application submitted by the POC/tax filer	1,193,965 (83)
	Two applications submitted by the POC/tax filer	200,948 (14)
	Three applications submitted by the POC/tax filer	30,315 (2.1)
	More than three applications submitted by the POC/tax filer	8,794 (.6)
	Missing	0 (0)
Radio Silent	If a document associated with approved Annual Income document types was mailed or uploaded to resolve a data matching issue from anyone in the household the value is No, otherwise the value is Yes	
Yes		(1,102,889) 76.9%
No		(331,133) 23.1%
Missing		0 (0)

Discussion of "Other" Variables

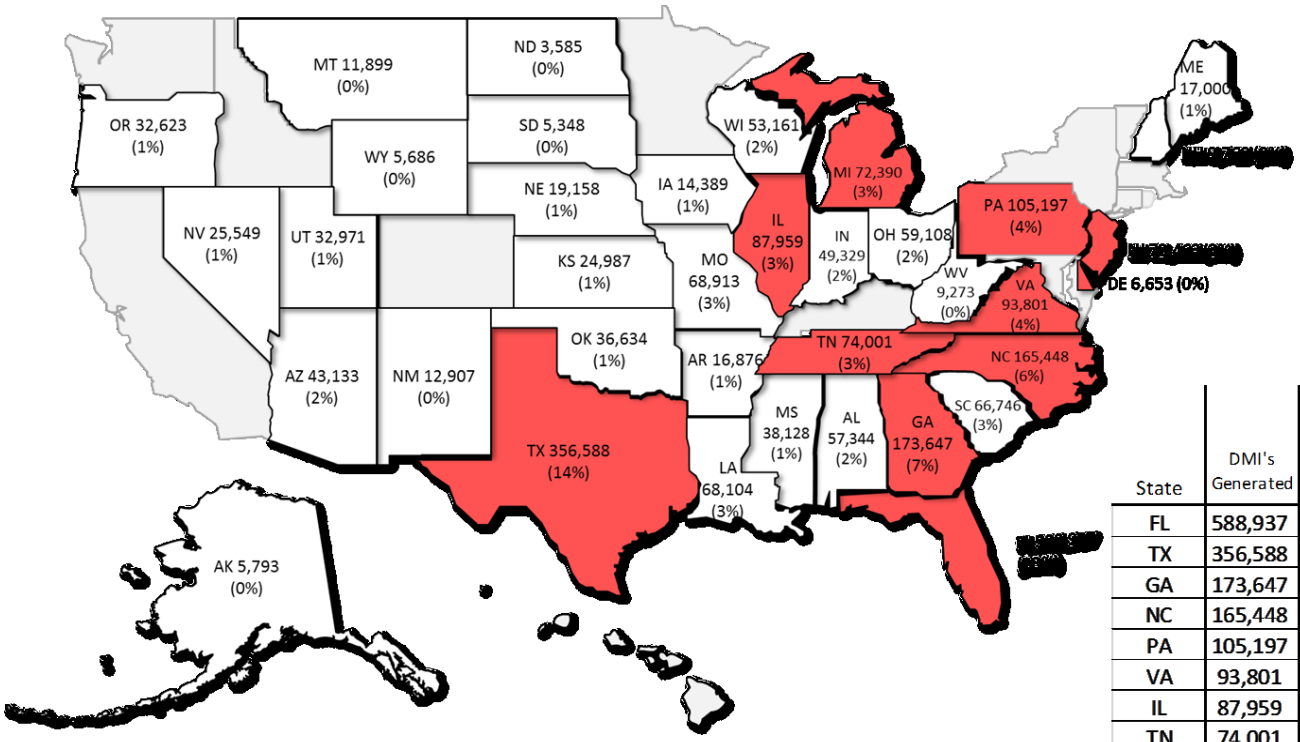
The final two variables are related to how many applications consumers within this study population submitted and whether or not consumers who were informed of their income DMI made an attempt to successfully resolve their issue. The data shows that approximately 83 percent of the study population only submitted one application, which demonstrates improvement in the HealthCare.gov interface and an improved consumer experience.[20]

Another very meaningful data point is displayed here, showing that approximately 77 percent of the study population did not submit documentation to resolve their income DMI, referred to as "radio silent" consumers. When stratified by enrollment status, 71 percent of the enrolled consumers were radio silent. These data highlight several concerns aforementioned, including consumer confusion with the data matching process, the Marketplace's inadequate notices and outreach strategy and the program integrity risks when consumers fail to comply with Marketplace requirements to retain eligibility. The Marketplace continues to collect significant operational statistics and information regarding documentation such as information on the types of documents consumers submit, how often documents are used to resolve DMIs, the types of documents such as W2s and pay stubs that are most successful in income verification, the reasons as to why submitted documents are unsuccessful in resolution, etc. which will be a continued focus in 2016.

[20] Precise comparison data are not available; however anecdotal evidence is sufficient to suggest that a high volume of applicants submitted multiple applications during the first open enrollment period. It was not uncommon to see a meaningful volume of consumers submitting upwards of 5 to 10 applications, and thus decreasing system performance and the consumer experience.

Phase 1: Part 2 Population Geographic Results

Figure 1: 2015 Plan Year Generated Income DMIs, Aligned with Study Population, by State[21]

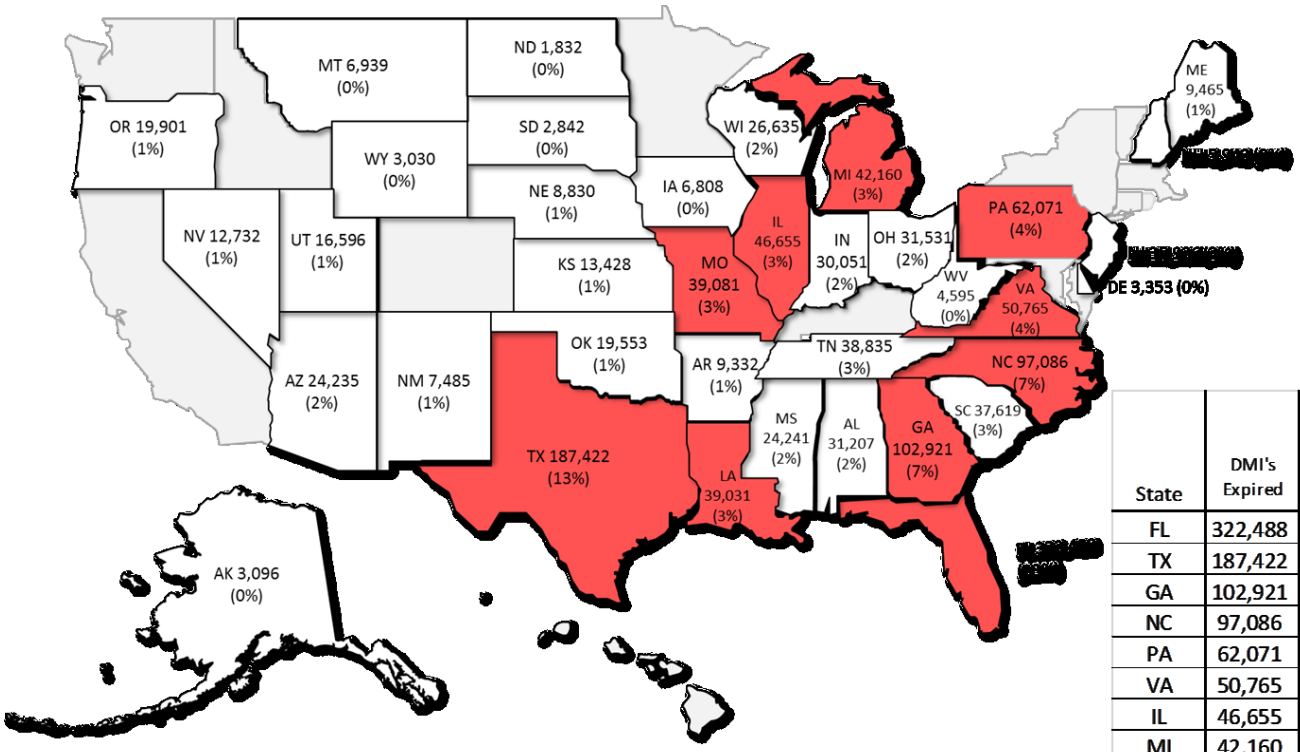


State	DMI's Generated	% of Total
FL	588,937	23%
TX	356,588	14%
GA	173,647	7%
NC	165,448	6%
PA	105,197	4%
VA	93,801	4%
IL	87,959	3%
TN	74,001	3%
NJ	72,463	3%
MI	72,390	3%

2,585,497 DMI's Generated for 2015 Enrollment Year

[21] States that operate their own State Based Marketplaces (SMBs), such as CA and NY are grayed out on the map. The Federal Marketplace does not process DMIs in SBMs at this time.

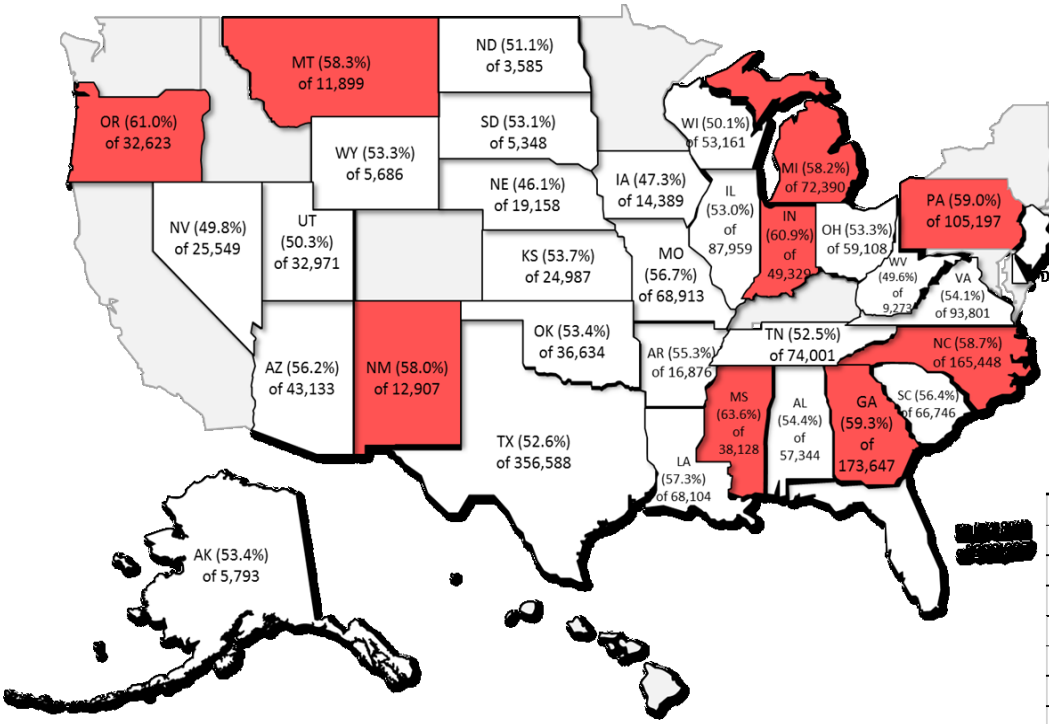
Figure 2: 2015 Plan Year <u>Adjustments</u> for Failure to Resolve an Income DMI, by State



State	DMI's Expired	% of Total
FL	322,488	23%
TX	187,422	13%
GA	102,921	7%
NC	97,086	7%
PA	62,071	4%
VA	50,765	4%
IL	46,655	3%
MI	42,160	3%
MO	39,081	3%
LA	39,031	3%

1.4M HHs Adjusted February through July 2015

Figure 3: Number and Percent of HHs Adjusted as Comparted to DMIs Generated, by State



State	DMI Expired % of DMI Generated	Rank
MS	63.6%	1
OR	61.0%	2
NH	60.8%	3
IN	60.9%	4
GA	59.3%	5
PA	59.0%	6
NC	58.7%	7
MT	58.3%	8
MI	58.2%	9
NM	58.0%	10

55.1% DMI's Expired to DMIs Generated for 2015 Enrollment Year

The tables and figures above provide a more detailed geographical picture of the volume of income DMI generation and adjustment, by state. In order to construct these graphs, we worked backwards from the count of confirmed income adjustments to identify all the "ever generated" income DMIs associated with the same cohort of the defined study population (households with a confirmed adjustment in the months of February through July, 2015). As expected, the number of DMIs generated for the study population is a smaller subset of all the income DMIs ever generated in plan year 2015, as some of the households experiencing an income DMI were not subject to clock expiration/adjustment as their inconsistency

period had not yet run out or the household was granted a clock extension, among other possible explanations.

Approximately 2.6 million income DMIs were generated for household's subject to a DMI clock expiration prior to July 31st, 2015 representing the highest volume of DMI activity in plan year 2015. The largest volume of income DMI generation occurred in Florida and Texas, with Florida generating 23 percent of all DMIs nationwide. Texas was nearly 10 percentage points behind with 14 percent and Georgia with 7 percent. The remaining FFM states contributed 6 percent, or less to the overall income DMI generation count.

In order to achieve the most accurate rate of overall Marketplace income DMI generation in HealthCare.gov the count of submitted applications needs to be compared to income DMIs generated on those applications for the same period. This process is now underway for plan year 2016 and thus will yield the best data available to the Marketplace in reporting precise income DMI generation rates, by application submission. For the purposes of this study, precise application submission data were unavailable and we had to work backwards from confirmed income DMI adjustments to achieve the baseline data for the number of DMIs generated for the study population. This approach limits the ability to draw final conclusions about the overall generation rate of income DMIs in the Marketplace for 2015. However, because of the large sample size, and significant number of consumers in the Marketplace impacted by income DMIs, making initial comparisons, appropriately caveated, to overall point in time enrollment statistics is valuable. Analysis of the June 30th snapshot is helpful to compare generated income counts to effectuated enrollment.[22]According to the June 30th, snapshot Florida accounts for approximately nineteen percent of the HealthCare.gov population receiving APTC, followed by Texas at thirteen percent, Georgia, North Carolina, and Pennsylvania at six percent and Virginia with five percent. These initial data, with the appropriate caveats, provide preliminary results that DMI generation is

[22] The September 30th, 2015 snapshot data are also available, however the June 30th snapshot is a more appropriate measure of comparison before the Marketplace starts to experience a drop in effectuated enrollment and more Marketplace fluctuations, in part due to income DMIs.

approximately on par with overall enrollment activity by state. In regards to an overall DMI generation rate in HealthCare.gov states, by taking the total study population who generated income DMIs as compared to the total effectuated enrollment with APTC, an estimated 42 percent of consumers receiving APTC generated an income DMI. Using the same methodology by state, income DMIs as a percentage of overall effectuated enrollment for those consumers with APTC, ranges from a low of approximately 25 percent in North Dakota to over fifty percent in Louisiana, Mississippi and Nevada. In this analysis, Florida and Texas have approximate generation rates of 49 and 44 percent respectively.

In regards to adjustment/clock expiration, Figure 3 reveals 55.1 percent of all households with an income DMI generated for the study period experienced an adjustment to their APTC for failure to resolve the income issue. Simply stated, the Marketplace, and the impacted consumers, are failing to resolve their data matching issues more than half of the time, with meaningful consequences in terms of loss of part or, all APTC. The analysis of adjustments in Figure 2, follows a very similar pattern to the generation rate, with Florida, Texas and Georgia demonstrating the highest rates of APTC adjustment for failure to resolve a DMI at 23 percent, 13 percent and 7 percent respectively.

When looking at the ratio of generated to adjusted income DMIs (Figure 3) the rank ordering changes from the prior two maps, demonstrating that states such as Mississippi, Oregon, New Hampshire and Indiana are experiencing the hardest time resolving their DMIs as a proportion of the number of issues generated. Mississippi experiences the highest DMI adjustment ratio of 64 percent. The data range displayed in Figure 3 is relatively compact with nearly all the Marketplace states falling between 50 and 64 percent. Nebraska experienced the lowest adjustment percentage at 46.1 percent. These ratios represent a first look at the scale of the income DMI problem and the degree to which the Marketplace is struggling to resolve a higher percentage of these cases.

Framework Phase 1, Parts 1 and 2: Population Descriptive Statistics Section Summary

These descriptive statistics represent the first comprehensive analysis of the demographic composition of the consumer population impacted by the income verification process. These data represent a significant effort by the Marketplace and the team of vendors, to accurately identify, protect and collect millions of consumer records from multiple sources and previously disparate databases, identify policy and program relevant variables, and establish methodologies paired with assumptions to define and measure the variables described in this chapter for consumers with income DMIs.

Data collection of this magnitude paves the way to not only report on available data statistics, but also to more easily perform a gap analysis to identify which critical data points are still missing, either because certain variables are not collected in initial data analysis efforts or the data are otherwise unavailable as seen with the limited available data on race. This research also allows for analysis of data anomalies that are immediately actionable such as the discovery of the high volume of missing emails which is a critical component of the Marketplace outreach strategy and the comparatively high amounts of APTC received by the study population as compared to the preliminary data on the general Marketplace population.

These data also are immediately helpful in allocating resources for the Marketplace outreach efforts and the eligibility support workforce. Demographic information on consumers such as age, language preference and household composition are important when developing training materials, education campaigns, Marketplace notices and help desk scripts. These data are also critically important when allocating workforce resources to assess volume of estimated income DMIs and projecting the volume of consumers likely to require special assistance to resolve their issues.

The data also provide insights into other program relevant factors, such as consumer response rates to the Marketplace outreach strategy. A careful accounting of the number of consumer households who fail to submit any income verification documentation at all is critical in terms of improving outreach campaigns and in considering heightened program integrity efforts and other oversight initiatives aimed at protecting

the tax payer dollar. Equally important is gathering information for the first time that reveals the percent of consumers losing all APTC at adjustment. Such data highlight for the Marketplace how often default income data are not available for Marketplace consumers who fail to resolve their DMIs and further incentivizes the Marketplace to investigate the root cause of missing or unavailable income data from key verification sources such as IRS, SSA and Equifax.[23] Initial analysis of the enrollment data available for this study also provides early insight into the changes in enrollment status for those consumers who are adjusted for unresolved income DMIs. While there are still some challenges with accurately counting enrollment across the Marketplace, the efforts here to effectively follow a defined cohort through the income adjustment process provide early evidence on the potentially dramatic impact strict income verification is having on Marketplace enrollment.

The geographic data provides first insights as to where in the U.S. the income verification process is having the most impact across the FFM states. Ideally, we'd also have complete and validated data regarding the rate of income DMI generation across the Marketplace as it pertains to submitted applications, and by state, and these data are being made available in 2016. Reasonable assumptions can still be made about the very high rate of income DMI generation across the general Marketplace and the greater volume logically experienced in states such as Texas and Florida where DMI generation rates are largely correlated with enrollment volume. Overtime, with the help of additional data collection improvements, geographic information such as the information provided here can be used to effectively target local media campaigns and consumer assistor resources.

In summary, the Marketplace is eager to improve data collection efforts and access data which can drive improved intervention and strategic planning. This research represents an important first step for the Marketplace in the endeavor to learn more about the consumers impacted by income DMIs and strive toward program improvements. The data will be an effective tool in establishing a baseline in which to

[23] A household failing to file a tax return is another root cause for limited IRS tax data availability. However, these data are considered protected federal tax information and cannot be disclosed to the Marketplace for these purposes at this time.

compare DMI activity against future enrollment periods (such as OE 2016 currently underway). In addition, the data will inform comparisons of the consumer population facing income DMIs with the general population to better inform the overall rate of DMI generation in the Marketplace and other important enrollment statistics.

Phase 1, Part 3: Marketplace Consumer Resources

Approximately 2.6M households generated an income DMI for the time period associated with this study, largely aligned with the second OEP. For this cohort, approximately 1.4M households experienced an adjustment to APTC and/or CSRs for failure to resolve the income data issue. Slightly less than 1 out of every 2 households with an income DMI will experience an adjustment to their level of financial assistance. The aforementioned data showed approximately 50 percent of enrolled consumers are losing all APTC at the time their eligibility is adjusted and it's a reasonable assumption that such loss is meaningfully correlated with disenrollment from their health plan. Although final data are not yet available about the precise correlation with disenrollment for failure to pay premiums and income DMIs, the data from this study showing a reduction of 20 percentage points in enrollment is a revealing early indicator.

The Marketplace recognizes consumers need assistance with the multiple steps in the application and enrollment process. The Marketplace Call Center, Eligibility Support Workforce, vast network of Consumer Assistor Programs, agents and brokers and the issuer community, among others all endeavor and are incentivized to assist consumers with the eligibility and enrollment process. Much of the focus on these collective efforts is assisting consumers with navigating the application and selecting and enrolling in a health plan. The Marketplace also provides extensive training and education opportunities to assist the vast network of resources in understanding the complex verifications process, including the processes for successfully resolving DMIs, and the consequences of unsuccessful resolution. In plan years 2014 and 2015, the Marketplace held webinars, phone conferences, in person meetings, released guidance

documents and a "how to guide" on income DMIs, to continue to engage these stakeholders on the importance of successful eligibility verification. Even still, the Marketplace, in partnership with this network of resources, needs to do more to help consumers navigate the complex verification process. Efforts are once again ramping up for plan year 2016 to improve the Marketplace's outreach strategy as well as strengthen the relationship with the network of resources helping consumers gain access to and keep their health care insurance.

One of the primary objectives of this study is improved data collection in order to enhance targeted resource allocation and provide the aforementioned stakeholders with more information about the scale of the income DMI problem and impacted consumers. Therefore, for Part 3 of Phase 1 of the Framework (Descriptive Statistics) the study population with 2015 plan year income DMIs is compared to the network of Marketplace Consumer Assistor Programs. The available data include resources, by state and zip code, of three types of Assistance Programs, including Navigators, Certified Application Counselors and Enrollment Assistance Programs (EAPs), all of whom took the 2015 Marketplace training, initially made available on September, 4, 2014, hereafter referred to as "Assistor Programs". The Marketplace training program is a comprehensive curriculum that covers the application through enrollment process; eligibility verification is a component but not the sole focus. Approximately 25,000 Assistor Programs who completed the 2015 training are included in this analysis.

The data were available at both the state and county level. An *At-A-Glance* summary of data matching activity and Assistor Programs by state is first displayed (Table 11). The county level data are then displayed for income DMI generation and adjustment, regardless of Marketplace Consumer Assistor Resources. Finally displayed are the counties with the highest volume of income DMIs, per resource available, to establish a baseline of how well resourced the counties with highest volume income DMI activity are relative to the available Marketplace resources.

Table 11: Top 10 States with Most Income DMI Generation and Adjustment Compared to Top 10 States with Assister Programs "At A Glance"

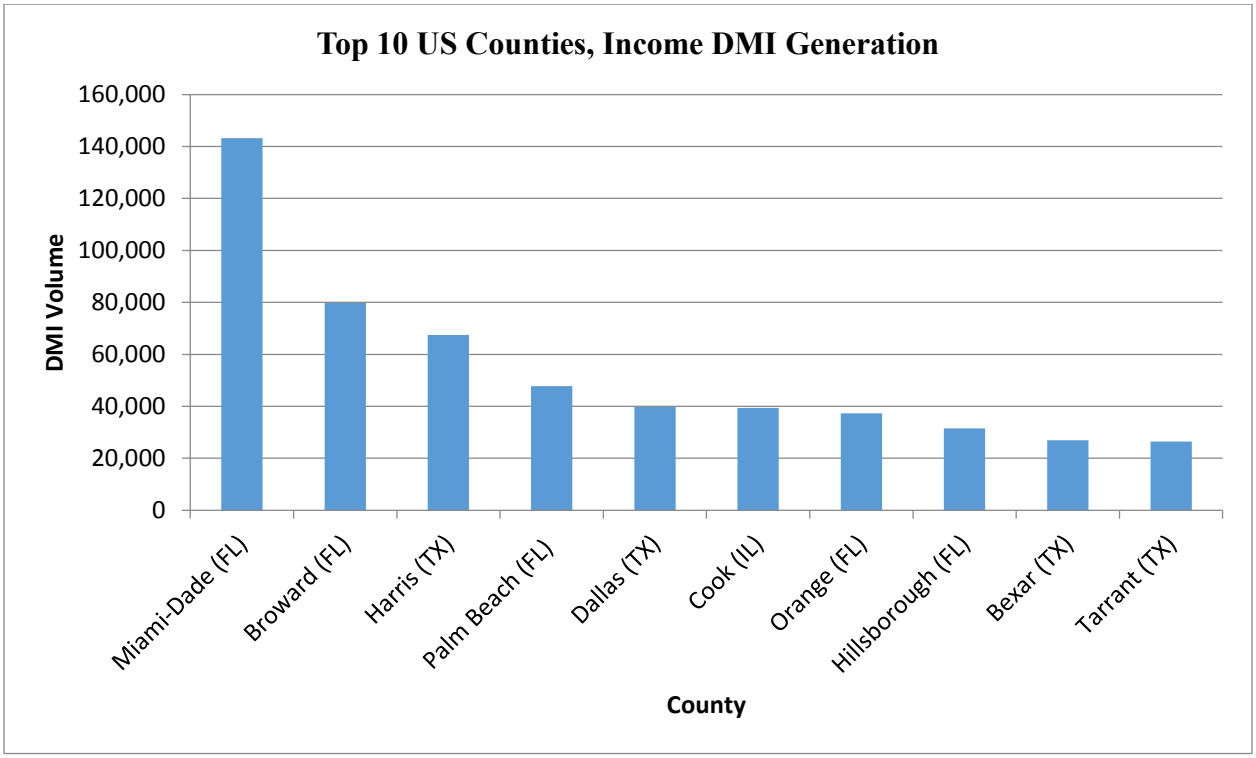
Rank	Income DMI: Generated (%, of all ever generated)	Income DMI: Adjusted (unresolved) (%)	Percent Adjusted per Generated	Assister Programs (#/% of all available resources)
1	FL (23)	FL (23)	MS (63)	TX 3,276 (13)
2	TX (14)	TX (13)	OR (61)	FL 2,678 (11)
3	GA (7)	GA (7)	NH (61)	IL 1,848 (7)
4	NC (6)	NC (7)	IN (61)	NC 1,207 (5)
5	PA (4)	PA (4)	GA (59.3)	PA 1,129 (5)
6	VA (4)	VA (4)	PA (59)	MI 1,083 (4)
7	IL (3)	IL (3)	NC (58.7)	TN 1,000 (4)
8	TN (3)	MI (3)	MT (58.3)	VA 987 (4)
9	NJ (3)	MO (3)	MI (58.2)	OR 978 (4)
10	MI (3)	LA (3)	NM (58%)	MO 889 (4)

The ten states with most available Assistor Programs are also present in at least one of the three categories of high volume DMIs described above, also aligned with the heaviest volume of Marketplace applications. Texas and Florida with the largest volume of DMI generation and adjustment also have the most available Assistor Programs. Several states with a high volume of DMI activity are not correlated with the top 10 states with resources. For example, Georgia and New Jersey, make the top ten for income DMI's generated, but are not listed in the top ten resourced states. Likewise, Louisiana makes the top 10 list for adjustments and is not listed in the top10 ten resourced states. When looking at the percentage of adjusted DMIs per generated DMIs, the picture is even more inconsistent with Mississippi, New Hampshire, Indiana, Georgia, Montana and New Mexico, all having adjustment percentages near or above 60 percent, but are not represented in the states with the top 10 Assistor Programs. These data

provide inaugural insights into how well resourced the Marketplace is in terms of Assistor Programs, specifically related to income verification and data matching.

In an effort to achieve more granular data the information is also displayed at the county level in the following tables.

Table 12: Top 10 U.S. Counties, Income DMI Generation



As displayed in Table 12, it's not surprising that the top 10 counties with the greatest volume of income DMI generation are nearly all in Florida and Texas, with the exception of Cook County Illinois. Understanding the volume of application submissions associated with each county would provide greater clarity here and will be a data analytics improvement for 2016.

Table 13: Top 10 U.S. Counties, Income DMI Adjustment

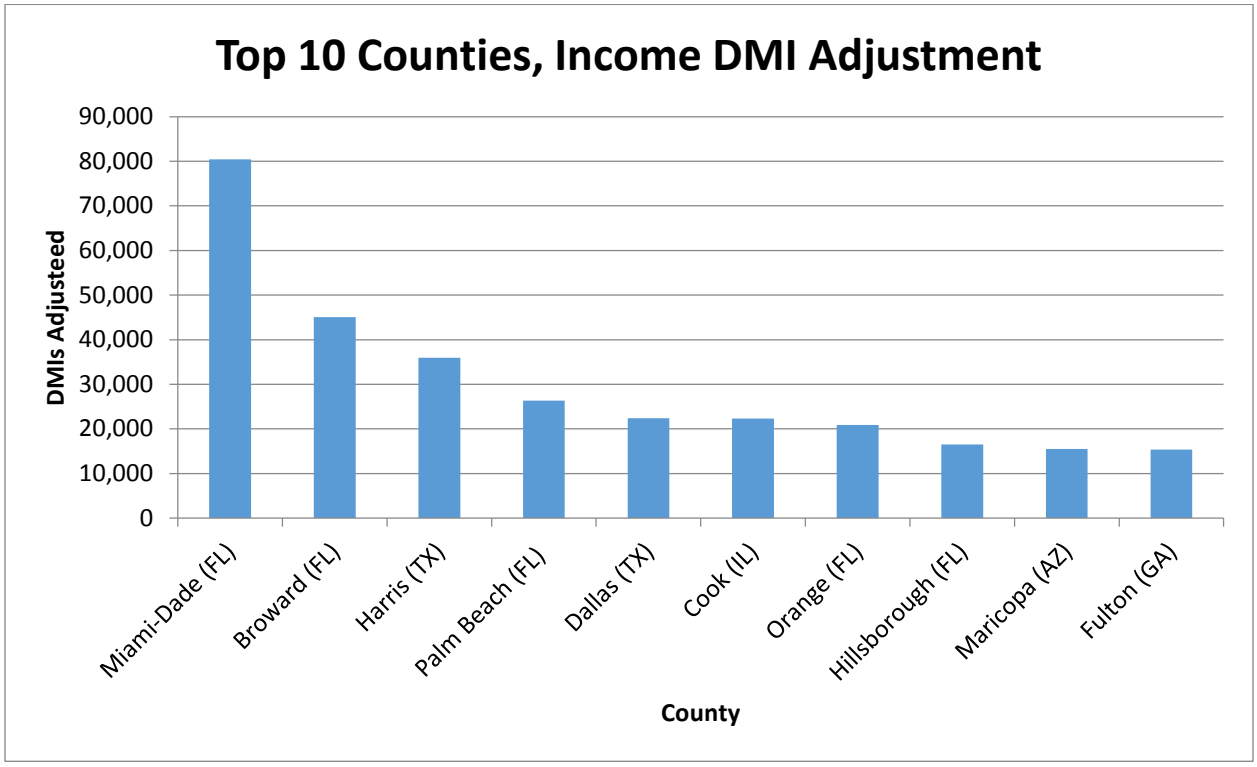


Table 13 shows nearly perfect alignment with Table 12 above, with the exception of Maricopa County (AZ) and Fulton County (GA) who enter the top 10 states experiencing income adjustments.

Table 14 Counties with the Greatest Percentage of Households Adjusted per income Data Matching Issue Generated

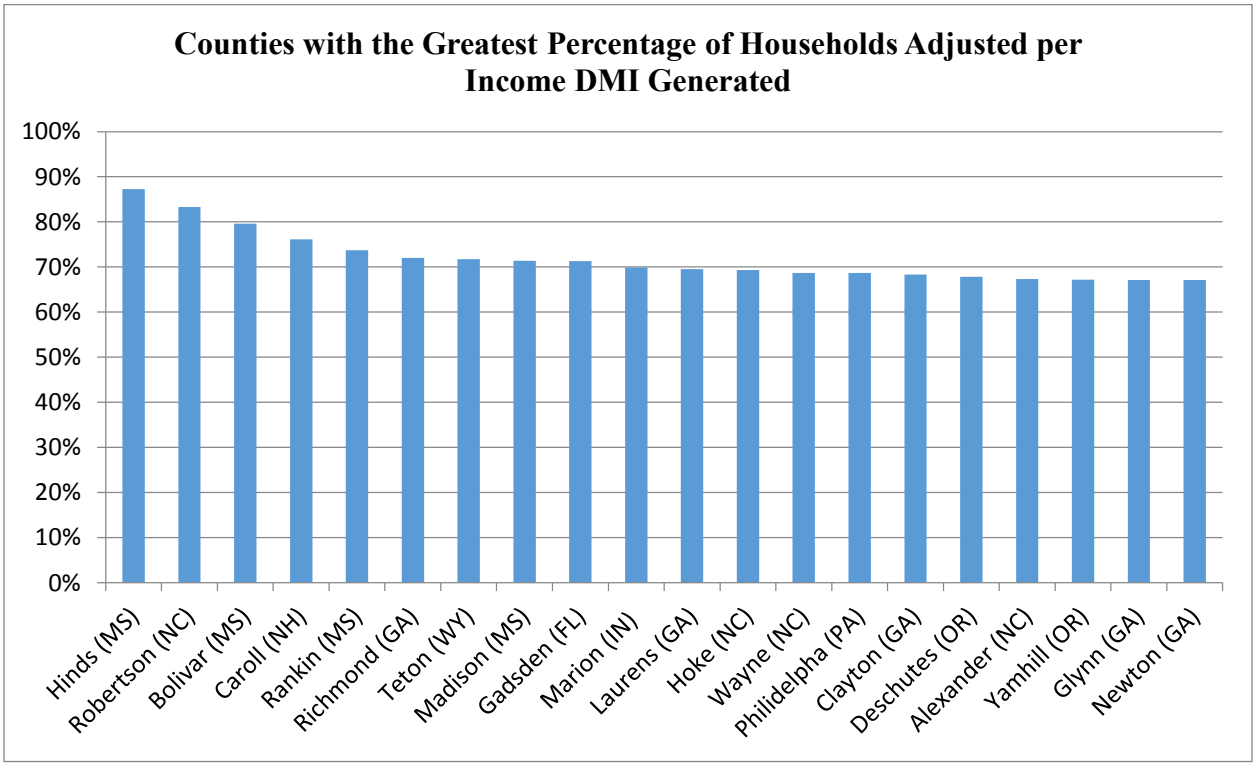
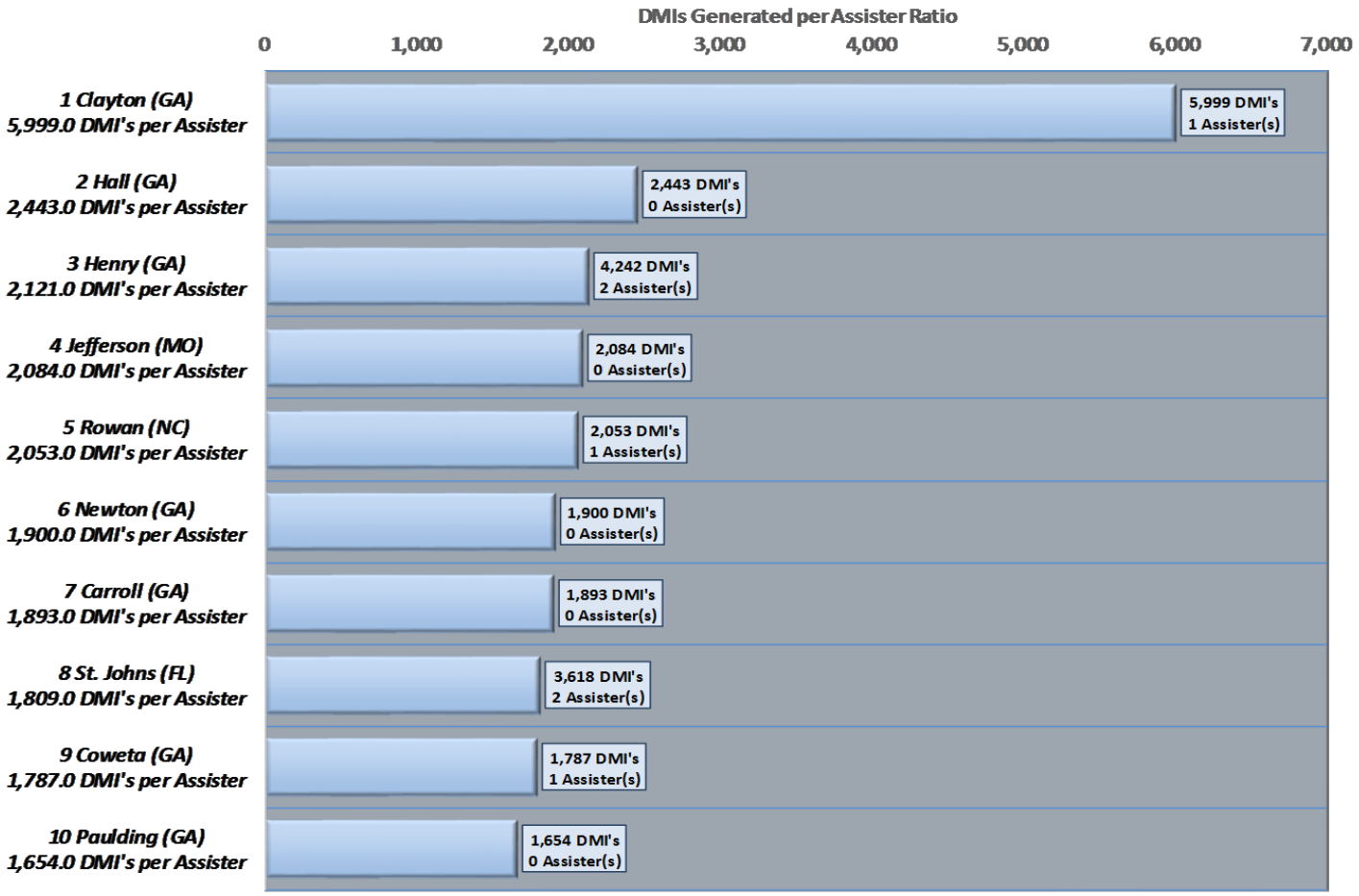


Table 14 demonstrates the composition of the top counties changes significantly when reviewing the percentage of adjustment to generation. These data specifically highlight those counties having the hardest time with the data matching resolution process. Counties in Georgia, Mississippi and North Carolina make up the highest percentages with Florida only showing up once and Texas entirely absent, even with the expanded display to include the top 20 counties. Mississippi appears four times in the top eight counties, and Georgia appears five times in the top 20 counties. These data represent the first time the Marketplace is able to analyze not only state by state income DMI generation and adjustment, but also to reveal those states and counties most struggling with DMI resolution. In the next set of tables counties with the greatest number of households with income DMI generations and adjustments per Assistor

Program are displayed at the county level. A simple ratio of DMI activity per Assistor Program resource(s) was established by dividing the volume of DMI activity by the number of available Assistor Programs in the county. It is noted where there are no available resources within a county.

Table 15: Income DMIs Generated per Assister Program Ratio

Table 15 displays the counties with the greatest volume of DMI generation per available Assistor Program. Interestingly, 5 out of the 10 displayed counties have no resources at all. Nine out of the 10 displayed counties are in the Southeast, with counties in Georgia appearing 7 out of 10 times indicative of the largest resource gap in assistance to consumers in preventing an income DMI at application



submission.

Table 16: Income DMIs Adjusted per Assistor Program Ratio

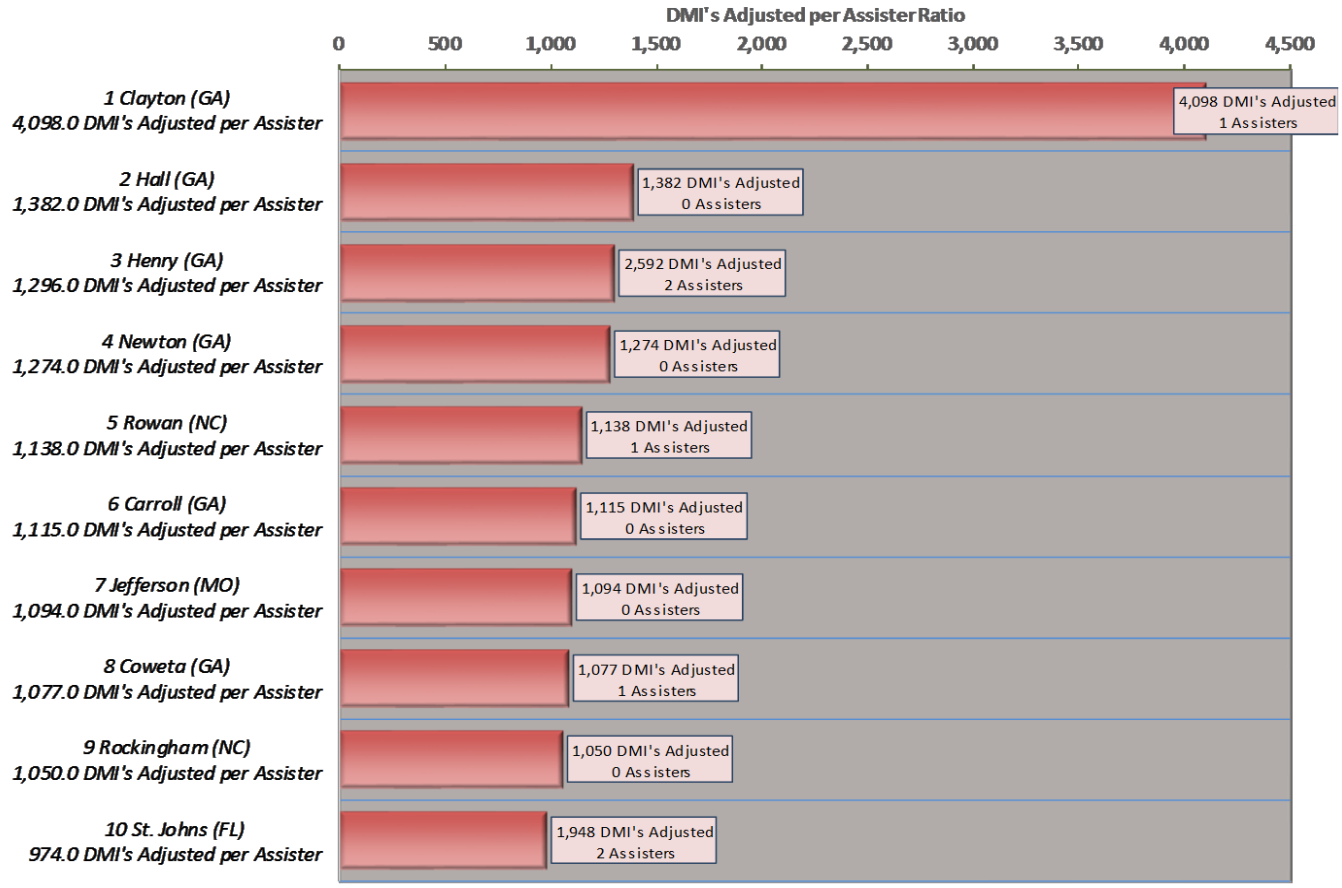


Table 16 displays the counties with the greatest volume of DMIs adjusted per available Assistor Program. Again, 9 out of the 10 displayed counties are in the Southeast, with counties in Georgia appearing 6 out of 10 times indicative of the largest resource gap in assistance to consumers with resolving income DMIs.

Phase 1, Part 3: Marketplace Consumer Resources: Section Summary

This is the first time the Marketplace has analyzed the consumer income DMI issues with consideration of geographic location by state, county and with a comparison to available Assistor Programs. It is also the first time the Marketplace successfully built a meaningful cohort of consumer data able to effectively follow the consumer population and access DMI relevant outcomes such as resolution status, adjustment status, loss of APTC and enrollment. The data demonstrating volume of income DMI generation as compared to adjudication status reveals significant information in regards to the extent of needed program

improvements to improve successful resolution and has revealed the degree of risk the Marketplace has in losing enrollment for consumer's failure to pay premiums associated with loss of financial assistance.

Accessing more specific state and county data, aligned with available Assistor Program resources, provides important initial insights as to where DMIs are most prevalent and how this relates to available resources. Specifically, these data are an important first step in highlighting the resource gap in the southeast U.S. in regards to eligibility verification, and highlights that additional research and investigation are needed to assess if there are adequate resources to assist Marketplace consumers in the eligibility verification process in this area. Immediately these data reveal the Marketplace needs to take a closer look at the available resources in Georgia to determine if more can't be done to assist consumers experiencing high rates of adjustments with low available consumer resources.

This is the first attempt to compare data on the network of available Assistor Programs to a defined study population with income DMIs and there are several weaknesses in the data collection approach. First, despite the best efforts, there are challenges in doing a precise cross walk of zip codes to counties across multiple databases. Best efforts were made to properly align the database of available Marketplace Assistor Programs by state and zip code with the Marketplace collection of databases that include consumer data matching activity by zip code, but some degree of error is possible. For example, there are certain zip codes that belong to multiple counties and business rules must be applied when considering zip code to county assignment that may introduce data errors or inconsistencies. In an effort to mitigate such inaccuracies, wherever possible the Marketplace uses the same zip code to county conversion software to maintain consistency across databases.

Additionally, accessing improved data about consumers across the Marketplace will allow the data matching program to make more meaningful comparisons about the data matching and income verification process aligned with Marketplace consumer activity. For example, accessing accurate data on the number of applications submitted for the general population with income DMIs will allow for key

assessments about the overall rate of DMI generation in the Marketplace and allow for year over year comparison. Achieving these data by state and county will be a critical next step in the data analysis and allow for even greater improvements in targeting and intervention. The Marketplace started open enrollment for 2016, with significant data collection improvements underway in these areas. Ongoing improvements in data collection efforts across the collective Marketplace programs, including the Assistor Programs, will help achieve a more robust data set and allow for more comprehensive data analytics aimed at helping the Marketplace learn about consumers and improve outreach and education interventions aimed at maximizing eligibility and enrollment.

In the next section more robust data analytics are performed to determine if via data mining techniques meaningful groupings, by consumer attribute, can be established to gain additional insights about the characteristics of those consumers who fail to resolve their DMIs and to determine if high risk populations can be identified for additional intervention.

[lxxi] Ibid. June 30th Enrollment Snapshot

[lxxii] Ibid. June 30th Enrollment Snapshot

Marketplace Income Verification Data Analysis Framework: Phase II. Cluster Analysis Results

In Phase II of the Marketplace Income Verification Framework data mining techniques are proposed to determine if meaningful groupings, or "clusters", of consumers can be established based on shared attributes within a very large data set. Knowledge of such clusters and their associated attributes will help provide a framework for targeting Marketplace resources, such as technical assistance and outreach with more efficiency, lower cost and ideally improved outcomes. The cluster analysis techniques will also help to identify the shared characteristics of high risk populations which are then applied to a predictive analytics model used to identify consumers most likely to struggle with the income verification process. Early detection of consumers who fit the "high risk" profile will allow for enhanced outreach and assistance, early on in the inconsistency period.

Step 1: Establishing the Cluster Groupings:

The data mining approach, using the Expiration Maximization (EM) cluster method, demonstrated the study population of 1.4M Marketplace consumer households can be characterized into ten distinct clusters based on shared attributes or variables.[24]

The EM cluster method automatically determines the ideal number of clusters for each data set. For this analysis, the recommended number of generated clusters is ten. Non scalable EM was employed, meaning that all 1.4M records were used in the first pass to establish and build the model. Additionally, the default stopping tolerance parameter of ten was used, which means the algorithm to complete the model, also referred to as "convergence", is successfully reached when the overall probability of a change in the cluster composition is less than the ratio of the stopping tolerance parameter of 10 divided by the size of the sample used in the initial pass (all 1.4M records). Achieving a ratio of 10:1.4M represents an

[24] The terms "attribute(s)" and "variable(s)" are used interchangeably throughout this analysis.

extremely low risk of a change in the cluster results presented here, and a sound model. Table 17 displays the initial 10 clusters based on the first run with membership and the associated cluster descriptions. Worth noting is that the data were run multiple times to test whether the default of 10 clusters was optimal for this study design. Other cluster sizes that were manually run included a cluster size of 5 and 20. As suggested by the default algorithm, the cluster size of 10, for a data sample of this size did end up being optimal. With five clusters it was nearly impossible to draw meaningful differences across the clusters and a cluster size of 20 made it more difficult to sufficiently identify the highest risk clusters and less relevant for program implementation.

Table 17: Baseline Cluster Model Membership

Cluster Number	Cluster descriptions as defined by ranking attributes (in order of rank)	Total number of records associated with the cluster	Percent of all records belonging to this cluster
1	Male, Single, Adult HHs, Enrolled at time of adjustment, Lost APTC at adjustment	307,393	21.4%
2	Race Selection "Other", Not receiving APTC, Not enrolled at adjustment, or Currently Enrolled, Multiple Adult HHs (Couples)	174,206	12.1%
3	Not Radio silent (submitted docs), Multiple Adult HHs (Couples), Currently Enrolled, Receiving high amounts of APTC, aged 45 to 64, retained APTC at adjustment	167,771	11.7%
4	Female, Single, Adult HHs, Receiving high amounts of APTC, Enrolled at adjustment, aged 45 to 64	161,730	11.3%
5	Multiple adult HHs (Couples) lost all APTC at adjustment, Enrolled at time of adjustment, Receiving high APTC, written language preference Spanish	125,245	8.7%
6	Received medium and low levels of APTC, Female, Single, Adult HHs, aged 18 to 24 and retained some APTC at adjustment	116,377	8.1%
7	Male, Multiple Adult HHs (Family), Receiving high amounts of APTC and lost all APTC at adjustment, Enrolled at adjustment, Currently Enrolled	97,622	6.8%

8	Not receiving APTC, Not enrolled, Single Adult HHs, also Not currently enrolled, Adjusted in the month of July, 2015, Radio silent (did not submit docs)	104,655	7.3%
9	Female, Couple HHs, Enrolled at adjustment and currently enrolled, Receiving High APTC, lost APTC and aged 25 to 44	94,186	6.6%
10	Receiving low APTC, Retained APTC at adjustment, Multiple Adults HH who are not enrolled and Radio Silent (did not submit docs)	84,837	5.9%
Total		1,434,022	

As shown in the above table, the ten established clusters are defined, and differentiated, by their leading ranking attributes, or the variables within each cluster with the highest probability of membership to the cluster. As discussed in Chapter 3, approximately 40 different attributes were used in the cluster analysis and thus the probability of each attribute's membership to each of the 10 clusters is not displayed. Instead, the most prominent attributes of each cluster are displayed in rank order. Cluster 1 dominates with membership representing 21 percent of the study sample. Cluster 1 has a high probability of single, adult male households, enrolled when action was taken to adjust APTC and who subsequently lost all of their APTC during the adjustment. This is certainly a population the Marketplace endeavors to assist. In cluster 2 (approximately 12 percent), households selected an "other" race, did not receive APTC and were not enrolled when the household was adjusted, and remain unenrolled at the end of the study period; this is not necessarily a population that requires immediate intervention. Cluster 3 (membership also approximating 12 percent), included households submitting documents in an attempt to resolve their income DMI, but were still unsuccessful (hence they are in this study population), couples who are still currently enrolled, receiving high amounts of APTC, who retained some portion of their APTC at adjustment. Members of cluster 3 have remained enrolled, for example at a higher proportion than cluster 1, not surprising as the cluster 3 population continues to receive premium assistance even after adjustment. Cluster 4 (11 percent membership) includes single, adult females receiving high amounts of APTC, enrolled when adjusted who are between the ages of 45 and 64; whether or not membership in this

cluster lost or retained APTC at adjustment is not a leading attribute. Cluster 5 (8.7 percent membership) is dominated by couples who are losing all APTC at adjustment, who were receiving high amounts of APTC, who are likely native Spanish speakers. Cluster five is likely to emerge as another key cluster to target.

Cluster 6, (8 percent membership) are households receiving medium and low levels of ATPC, who are female, single adults, aged 18 to 24; this group is also retaining some amount of APTC when adjusted. Cluster 7 (7 percent membership) are male dominated, family households receiving high amounts of APTC, and losing all APTC at adjustment but remaining enrolled as of the end of the study period. Much like cluster 5, cluster 7 signals a key cluster for targeting as we continue with the next steps of the Cluster analysis.

Cluster 8 (approximately 7 percent) are households who are not receiving APTC, may have never enrolled, single adults adjusted late in the study period (July, 2015). Not surprisingly these households are not responsive to the Marketplace outreach efforts (radio silent) and we would not consider cluster 8 a target population. Cluster 9 (7 percent) are female, couple households, enrolled, receiving high amounts of APTC, losing all their APTC at adjustment and who tend to be younger; they are also a potentially important target population. Our final cluster, cluster 10, (just under 7 percent) are households receiving low APTC who are retaining some amount of APTC eligibility at adjustment but who tend not to be enrolled and thus did not submit documents; they are not a likely target population.

Interestingly, key attributes included in the cluster analysis and previously analyzed as part of this research, such as geographic location, did not appear as leading ranking attributes in any of the 10 clusters. A more careful analysis of the data reveals geographic location quickly follows the top 10 attributes of each cluster, typically ranking between attribute number 11 and 25 across the 10 clusters. For example, high likelihood of membership in the southeast is the 13th most relevant attribute for the highest

volume cluster 1. High likelihood of living in either the southwest or southeast is ranking attributes 11 and 12 respectively for cluster 5.

The initial step in the cluster analysis achieved the objectives of first confirming the EM data mining technique was successful in establishing a model algorithm for a very large data set, successfully establishing10 distinct clusters. Secondly, via analysis of the inaugural cluster run, the data allowed for an initial assessment of the clusters, and their associated combination of attributes useful in targeting future interventions, specifically identifying which combinations of attributes (or variables) are most likely associated with an adjustment of APTC, and worse, loss of all APTC at adjustment.

Step 2: Identifying the Clusters with the Highest Risk of Losing all APTC at Adjustment

After the baseline run and model algorithm are determined the next step is to analyze these clusters by the risk factor of losing all APTC at adjustment. As we recall, 39.1 percent of our study population receiving APTC/CSRs lost all APTC at adjustment for failure to resolve their income DMI. Step 1 of the cluster analysis demonstrated "Lost APTC" as a leading attribute in many of the defined clusters, with clusters 1, 5, 7 and 9 initially identified as potential "high risk" clusters. This assumption is tested by looking at all the data points (households) in each defined cluster to determine the percent of these households, by cluster, which lost all APTC at adjustment. Table 18 displays the percentage of APTC lost both within and across clusters to determine if those clusters that are most at risk of losing all APTC at adjustment can be identified and to confirm our initial assumptions of Step 1.

Table 18: Clusters with the Highest Risk of Losing all APTC at Adjustment

Cluster Number	Cluster Name as defined by Favoring Attributes (in order of favoring)	Total Counts of Records in Cluster	Total number of records in Cluster that lose all APTC	Percent of Records within Cluster, with all APTC lost	Percent of All APTC lost out of total APTC lost

1	Male, Single, Adult HHs, Enrolled at time of adjustment, Lost APTC at adjustment	307,393	160,225	52.1%	28.6%
2	Race Selection "Other", Not receiving APTC, Not enrolled at adjustment, or Currently Enrolled, Multiple Adult HHs (Couples)	174,206	0	0%	0%
3	Not Radio silent (submitted docs), Multiple Adult HHs (Couples), Currently Enrolled, Receiving high amounts of APTC, aged 45 to 64, retained APTC at adjustment	167,771	68,057	40.6%	12.1%
4	Female, Single, Adult HHs, Receiving high amounts of APTC, Enrolled at adjustment, aged 45 to 64	161,730	82,363	50.9%	14.7%
5	Multiple adult HHs (Couples) lost all APTC at adjustment, Enrolled at time of adjustment, Receiving high APTC, written language preference Spanish	125,245	106,502	85.0%	19%
6	Received medium and low levels of APTC, Female, Single, Adult HHs, aged 18 to 24 and retained some APTC at adjustment	116,377	43,319	37.2%	7.7%
7	Male, Multiple Adult HHs (Family), Receiving high amounts of APTC and lost all APTC at adjustment, Enrolled at adjustment, Currently Enrolled	97,622	51,508	52.8%	9.2%
8	Not receiving APTC, Not enrolled, Single Adult HHs, also Not currently enrolled, Adjusted in the month of July, 2015, Radio silent (did not submit docs)	104,655	0	0%	0%
9	Female, Couple HHs, Enrolled at adjustment and currently enrolled, Receiving High APTC,	94,186	47,4777	50.4%	8.5%

	lost APTC and aged 25 to 44				
10	Receiving low APTC, Retained APTC at adjustment, Multiple Adults HH who are not enrolled and Radio Silent (did not submit docs)	84,837	951	1.1%	0.17%
Total		**1,434,022**	**560,432**	**39.08%**	

Table 18 identified five clusters where over 50 percent of the cluster population is losing all APTC at adjustment: cluster 1, cluster 4, cluster 5, cluster 7 and cluster 9. Per the above discussion, it is not surprising to see clusters 1, 5, 7 and 9 represented in the above table. Cluster 4, with 51 percent of its membership losing all APTC is the exception; however, when returning to the EM model and taking a "deeper dive" into cluster 4, the "Lost APTC" attribute appears as the 11th ranking attribute, which is still a high placement in the overall ranking of approximately 40 attributes. Cluster 1, with the largest volume of records, and with 52 percent of the households losing all APTC, accounts for 28.6 percent of all of the households that lost all APTC in the entire study sample. Cluster 5 is definitively the most "high risk" cluster. Although cluster 5 only represents 8.7 percent of the households in the study population, this cluster represents 19 percent of all households losing APTC in the sample, with a staggering 85 percent of the households within Cluster 5 with a very high probability of losing all APTC. Clusters 4, 7 and 9, representing 11.3, 6.8 and 6.6 percent of the sample respectively also make up a proportionally larger percentage of the population losing APTC at 14.7, 9.2 and 8.5 percent respectively and are worth a closer look in the third step of the analysis. Table 19 summarizes the newly identified "high risk" clusters.

Table 19: Clusters where over Fifty Percent of the Population is losing all APTC at adjustment- Designated "High Risk Clusters"

Cluster Number	Cluster Name	Total Counts of Records in Cluster	Percent of all records belonging to Cluster	Total Number of Records in Cluster that lose all APTC	Percent of Records within Cluster, with all APTC lost	Percent of All APTC lost out of total APTC lost
1	Male, Single, Adult HHs, Enrolled at time of adjustment, Lost APTC at adjustment	307,393	21.4%	160,255	52.1%	28.6%
4	Female, Single, Adult HHs, Receiving high amounts of APTC, Enrolled at adjustment, aged 45 to 64	167,771	12.1%	82,363	50.1%	14.7%
5	Multiple adult HHs (Couples) lost all APTC at adjustment, Enrolled at time of adjustment, Receiving high APTC, written language preference Spanish	125,245	8.7%	106,502	85%	19%
7	Male, Multiple Adult HHs (Family), Receiving high amounts of APTC and lost all APTC at adjustment, Enrolled at adjustment, Currently Enrolled	97,622	6.8%	51,508	52.3%	9.2%
9	Female, Couple HHs, Enrolled at adjustment and currently enrolled, Receiving High APTC, lost APTC and aged 25 to 44	94,186	6.6%	47,477	50.4%	8.5%
Total Across High Risk Clusters		**786,176**	**55%**	**401,549**		**72%**

As displayed in Table 19, the combination of clusters 1, 4, 5, 7 and 9 are now designated as the "high risk" clusters. The households in these five combined clusters comprise 55 percent of the study population, but account for 72 percent of all households losing all APTC at adjustment for failure to resolve an income DMI.

Step 3: Establishing the Model: The Predictive Value of the "High Risk Clusters:

Step 1 established that a baseline of 10 clusters with defined attributes can be successfully determined within the large data set for the defined study population. Step 2, successfully identified the high risk clusters and their associated attributes. Step 3, perhaps the most important step, is to determine if this analysis can be used to *predict* future consumer households who are most at risk of losing all their APTC at the time their data matching issue is *initially* generated in order to flag these households and implement targeted interventions early on in the 90-day inconsistency period.

In order to use the 2015 baseline data to move to a predictive model, the model needs to be tested without those attributes that are not knowable at the time a household income DMI is initially generated at application submission. For example, several of the key study attributes such as the household is "radio silent", "lost APTC" at adjustment and "current enrollment status" at the end of the study period are not knowable information when the DMI is initially generated for a household and the initial outreach efforts begin. These variables must be removed from the data model to see if the model still generates "high risk clusters". Chapter 3 (Methods) discussed the removal of the lag variables, identified as the attributes associated with "radio silent", "current enrollment", and "lost APTC". The results of the cluster analysis after removal of these lag attributes are displayed below in Table 20.

Table 20: Cluster Membership after Removal of the Lag Variables

Cluster Number	Total Counts of Records in Cluster	Percent of all records belonging to	Total number of records in Cluster that	Percent of Records within	Percent of All APTC lost out of

		Cluster	lose all APTC	Cluster, with all APTC lost	total APTC lost
1	307,388	21.4%	160,250	52.1%	28.6%
2	174,059	12.1%	0	0%	0%
3	131,547	9.1%	66,329	50.4%	11.8%
4	159,539	11.1%	79,408	50.0%	14.2%
5	148,915	10.4%	89,145	60.0%	15.1%
6	118,573	8.3%	46,279	39.0%	8.2%
7	101,512	7.1%	53,222	52.4%	9.5%
8	104,802	7.3%	0	0%	0%
9	97,004	6.7%	49,430	51%	8.8%
10	90,683	6.3%	16,369	18.1%	2.9%
Total	**1.4M**		**560,432**		**39.1%**

After removing three important variables the model still successfully predicts a similar sample of high risk clusters. Cluster 3 emerges as having 50 percent of the population at high risk under the revised model. Cluster 5 remains the highest risk cluster at 60 percent of the households at risk of losing all APTC at adjustment. While this is a meaningful decrease from the 85 percent of records previously seen, 60 percent is still a significant difference from the risk of the overall population at 39.1 percent, and thus the cluster of attributes associated with cluster 5, even after removal of the lag variables, still represents the most "high risk" for losing all APTC. Table 21, provides a high level summary of the movement of data associated with the revised model to eliminate the lag variables in the Prediction Model.

Table 21: High Risk Clusters After Removal of the Lag Variables – Delta

Cluster Number	Total Counts of Records (+/- record change from run prior to Lag	Percent of all records belonging to Cluster (% change)	Total number of records in Cluster that lose all APTC	Percent of Records within Cluster with all APTC lost (percent change)

	Variables)			
1	307,388 (-5)	21.4% (0%)	160,250 (-5)	52.1% (0%)
3	131,547 (-36,224)	9.1% (-3.0%)	66,329 (-1,728)	50.4% (+9.9%)
4	159,539 (-2,191)	11.1% (-0.2%)	79,408 (-2,955)	50.0% (-1%)
5	148,915 (+23,670)	10.4% (+2.3%)	89,145 (-17,357)	60.0% (-25%)
7	101,512 (+3,890)	7.1% (+.03%)	53,222 (-1,714)	52.4% (-.33%)
9	97,004 (+2,818)	6.7% (+.01%)	49,430 (+1,953)	51% (+.56%)

For a study population of over 1.4M records, the removal of the three lag variables was not associated with heavy movement in the number of records now belonging to different clusters and thus the distributions of each cluster did not shift more than 3 percent in either direction for the overall sample. More significant shifting is seen when looking at the total number of records within each cluster that lose all APTC at adjustment. As noted above, while cluster 5 gained ~24k records in the revised model, this cluster also lost ~17k households where all APTCs was lost, and thus we see the 25 percentage point decrease, from 85 percent of the cluster experiencing a loss in all APTC to 60 percent of the cluster losing all ATPC. Cluster 3, loses records across the board; however, the remaining households in cluster 3 have a larger risk of losing all APTC with the second run of the model without the lag variables. Note there was very little change in the risk profile of cluster 1 (the largest cluster) and clusters 4, 7 and 9 pre-post, Predictive Model.

In summary, the results of the cluster analysis first demonstrate data mining using the EM cluster methodology was successful with the categorization of the large study population, including over 1.4 million records, into 10 distinct clusters providing key consumer profiles based on clustered attributes about the type of households experiencing an income DMI adjustment in 2015. Secondly, five clusters, clusters 1, 4, 5, 7 and 9, are identified as the most “high risk” with over 50 percent of their households at risk of losing all APTC at adjustment. Cluster 5 emerged as by far the most “high risk” with

approximately 85 percent of the population at risk of losing all APTC in the initial model and remaining "high risk" with approximately 60 percent losing all APTC in the prediction model removing the "lag" variables. These first two steps established the foundation to identify, flag, and target Marketplace households with the cluster of associated attributes most likely to result in total loss of APTC. Finally, in order to assess the predictive value of our cluster data model for use in 2016 and beyond, the lag materials were removed and the model algorithm was re-run to determine a "high risk" population could once again be determined to successfully identify at risk populations by their combined attributes in order to implement targeted interventions in the very early stages of the 90-day data matching cycle.

Framework Phase 2 Cluster Analysis: Section Summary

The results of this study identify the segments of Marketplace consumers most at risk for losing APTC/CSRs for failure to resolve their income DMIs. The study is the first to apply cluster segmentation techniques to Marketplace consumers. Ideally this analysis should be a starting point for additional ongoing research and analysis to identify and learn more about the "high risk" clusters and to test, pilot and perform focus groups on revised interventions such as more targeted outreach and education efforts.[lxxiii] As the Marketplace grows more sophisticated, additional analysis such as the data mining techniques used here, will continue to be deployed in an effort to better understand Marketplace consumers and improve the ability to optimally target interventions where needed most, with quite often limited resources.

Certain limitations of this study are worthy of acknowledgment. First the study population is comprised of consumers who experienced an adjustment at clock expiration for failure to resolve their income DMIs, not all Marketplace consumers with DMIs generated, and thus there may be components of both the cluster and demographic results limiting the generalizability to the full Marketplace population in targeting interventions aimed at preventing DMIs. Second, the income DMI process has adversely impacted such a large cross section of Marketplace consumers it's difficult to ascertain if resources are

better spent implementing global, program-wide interventions and program changes vs. spending resources on consumer level interventions aimed at targeting only certain individuals who meet the profile of "high risk". The goal is that overtime the income verification process will become simplified for the mainstream of Marketplace consumers, thus freeing up more dedicated resources for sophisticated analytics that would identify the most vulnerable populations for targeted interventions.

In summary, the collective results of Phase 1 and Phase 2 as specified in the *Framework* provide critically important insights on the Marketplace consumer population most struggling with the income verification process. This research establishes a sound and statistically significant data set in which to study a high volume of consumers with income DMIs. With this new baseline data, the Marketplace can successfully ascertain patterns of demographic statistics, policy and program relevant variables such as consumer response rates, loss of APTC, and enrollment status. The Marketplace can employ these results to plan for resource availability and design more targeted outreach and education interventions. This data analysis also successfully establishes the baseline by which to measure DMI and adjustment volume in future plan years. These dynamics and options for next steps are discussed in more detail in Chapter 5.

[lxxiii] Ibid. (Slater, 1996)

Chapter 5 Marketplace Income Verification Study: Discussion and Recommendations

Marketplace Income Verification Action Plans

The Marketplace Income Verification Data Analysis Framework (Appendix A) outlines the high level approach to applying the 2015 income DMI results to population and consumer level interventions in future plan years. Phase 1 of the Framework was comprised of three parts. Part 1 summarized the results of the study population descriptive statistics, Part 2 provided additional geographic results, by state, of DMI activity and Part 3 provided an analysis of Marketplace consumer Assistor Programs in relation to income DMI activity. The following sections further discuss the study results within the *Framework* of how these initial findings may be utilized to enhance Marketplace outcomes, particularly in the areas of data collection, measurement, and targeted outreach and education.

Phase 1: Population Descriptive Statistics

Aligned with the *Framework*, one of the primary goals achieved by this study is the establishment of a robust and verified data set of plan year income data matching activity which can be used as a baseline to measure and evaluate future plan years. The recommendation is for the program to use the approach to descriptive statistics employed here to establish a strategic data plan memorializing an ongoing effort to collect, verify and report income DMI data. The objectives of the strategic data plan are outlined here. First, the strategic data plan should consider the importance of coordination of information and databases across the Marketplace and alignment with other strategic Marketplace reporting efforts, such as the quarterly enrollment snapshots. Second, the strategic data plan must also establish an executive briefing approach, responsive to the high profile nature of the ACA, high volume of requests for information and data on DMIs, and the significant attention paid to income DMIs by the media and other high-profile

stakeholders such as the White House and HHS Secretary and the GAO and OIG. Third, the plan should outline how the approach to data collection and analysis will strengthen program integrity measures and inform efforts to implement appropriate oversight measures, such as more robust audits, where necessitated. Fourth, the strategic data plan should pick up where the data reported within this study left off and make course corrections to access additional data where necessary. Significant progress has been made in 2016 to track and report rates of overall DMIs in the Marketplace with sound methods to compare application submission rates to DMIs and effectuated enrollments. Other examples of data improvement opportunities include accessing Marketplace-wide data aligned with the descriptive statistics presented in this study to allow for further analysis and comparison of the DMI population with the general population of Marketplace consumers. Specific examples include Marketplace wide data on the household composition and household language preference of all Marketplace consumers.

Fifth, there are significant opportunities to further analyze data regarding the APTC-related variables. The study data demonstrate a higher amount of average monthly APTC for consumers with income DMI issues as compared to the averages reported in the quarterly enrollment snapshots. Efforts should be made to further analyze and compare how both of these figures are reported to allow for more accurate comparisons and final conclusions based on fully validated data. There is also opportunity to refine data collection efforts regarding the average APTC loss at DMI expiration/adjustment. The reported study data highlights the significant population losing all APTC at adjustment and future data collection efforts should strive to report data on average APTC loss at adjustment by demographic variables such as state and household composition as well as other factors such as enrollment status. In addition, there should be an ongoing plan to track and collect data on the enrollment status of consumers who lost APTC, by cohort, to further understand the rate at which consumers drop out of the Marketplace for failure to resolve income DMIs. Additionally, it's important to track to other activity by consumers with income DMIs, such as how often such consumers reported life changes (for example changes income and access

to ESC) and the impact of such application updates on repeated income DMIs generation for the same household.

Sixth, the strategic data plan should establish a plan for reporting information about not only non-responsive consumers, but also those consumers who submit documentation insufficient for resolution. Developing an improved understanding of the type of documentation successfully used in verification will better inform education and technical assistance interventions such as outreach letters, insufficient documentation letters and "how to guides". Additionally, information collected about unsuccessful documentation submission is also critically important for oversight efforts as well as studying inefficiencies in program resources, for example cost of eligibility workers analyzing documents which cannot verify eligibility.

Seventh, the strategic data plan should endeavor to collect and analyze data on the root causes of the data matching issues and the upfront application verification process. Gaining further insight as to why an income DMI was generated in the first place will inform interventions aimed at prevention. Critical to this endeavor is accessing more data on the performance of the eligibility verification data matches with SSA, IRS and Equifax and the success rate at which these sources are used to verify income. Such information is also critical in determining the Marketplaces return on investment of the cost to" ping" these sources via the Hub as well as cost savings from not having to manually verify eligibility. Equally important is understanding the root cause of the income DMI when automatic electronic verification is not possible. Obtaining specific data on outcomes such as household applicant(s) did not provide a SSN, or applicant provided SSN but SSN was not validated with SSA, no income data on file with the IRS, income on file with the IRS but not reasonably compatible with attestation, no available Equifax data, etc. are all informative for the Marketplace in terms of why DMIs are generated, future education opportunities and resource allocation.

Additionally, more data specifically analyzing the tax data when available to compare the household attestation to see how often the "reasonable compatibility" standard is achieved is valuable in making policy decisions about appropriateness of thresholds used in generating DMIs. Prevailing thought is the 10 percent threshold currently used is too narrow a threshold for the Marketplace population and access to additional data about the margin in which consumers miss this threshold will inform Marketplace policies.[25]

Eighth, and finally, it's critically important for the data strategy to develop a plan to study and analyze the end to end consumer experience from income verification through tax reconciliation. Such data is key to understanding how consumers with income DMIs are faring during tax reconciliation to determine if any patterns emerge among consumers with income DMIs vs. the general population during tax reconciliation, including data on *failure to reconcile* among this population. One of the most important data points collected from the recommended strategic data plan is the extent to which consumers who lose access to APTC via the income DMI process, ultimately are eligible for tax credits. Such results will inform how well the Marketplace is balancing program integrity, the consumer experience and limited Marketplace resources. Other experts (Graves, 2012) have also pointed to the importance of advanced analytics into the extent of over and underpayments of subsidies and the need for cost effectiveness studies to analyze the dynamics of electronic income verification and repayments (Jacobs, 2015).[lxxiv]

Phase 1, Part 3 (Marketplace Consumer Resources) represents the first attempt to compare the network of available Assistor Programs with the geographic representation of data matching activity. While these data are preliminary it is an important first step in analyzing available resources and potential resource gaps. Recommended next steps include additional coordination at CMS between the programs overseeing data matching and the collective consumer support programs to analyze these results and identify opportunities for improvement in data collection. Verifying the results among all teams and fostering a

[25] CMS is seeking official comment on the standard used for reasonable compatibility in the 2016 Payment Notice. https://www.cms.gov/CCIIO/Resources/Fact-Sheets-and-FAQs/Downloads/2016-PN-Fact-Sheet-final.pdf

culture of championing a strategic data plan will allow for progress in the consideration of future resource allocation in the Navigator program. Specific areas of improvement and coordination include additional analysis, perhaps by a third party, to verify the approach to count consumer resources in certain counties by zip code with confirmed DMI activity to assure accurate comparisons are made and additional data collection and survey measures aimed at addressing the extent to which Assistor Programs specifically provide DMI help to consumers. For example, more survey questions are needed about the extent to which assistor programs help consumers construct their projected household income and gather appropriate documentation in support of the provided income figure. Moreover, the initial data collection effort employed here can be expanded to include other elements of the collective Marketplace stakeholders aimed at helping consumers through the DMI process such as the Marketplace Call Center, issuers, and advocacy groups among other resources.

In summary, Phase 1 of the Marketplace Income Verification Data Analysis Framework lays the groundwork for establishing mission critical baseline data; the establishment of a more comprehensive strategic data plan will only strengthen the Marketplace's improvement efforts and provide key information to inform program operations, stakeholder engagement and improved technical assistance and consumer education and outreach.

Phase II: Cluster Analysis

The cluster analysis techniques, including the predictive model, were successful in building a consumer profile based on the characteristics of "high risk" consumers most likely to experience an adverse outcome from the income verification process. Early detection of consumers who fit the "high risk" profile will allow for enhanced outreach and assistance early on in the inconsistency period. Based on these actionable results, one recommendation is to implement a pilot program. The objective of this consumer level intervention would be to identify and flag a sample of those consumers with income DMIs who meet the criteria of the "high risk" profile. Cluster 5, is a logical starting point with over 85 percent

of this population losing all APTC at adjustment. Cluster 5 is associated with a strong probability of the following attributes: multiple adult (couples) household, receiving high amounts of APTC who speak Spanish. The pilot program would identify and flag "high risk" consumers, track and measure the experience of these consumers through the income verification process and provide these consumers with a more intensive, now targeted, outreach and assistance program in an effort to resolve the income DMI. A sample of the consumers flagged as "high risk" could also serve as a control group with the current standard of outreach and education. A control group would have the added benefit of comparing outcomes within the sample of consumers flagged as "high risk" and then also allow for comparison of the consumers flagged as "high risk" with the general population of consumers with income DMIs also receiving the current standard of outreach and education. The goal of such a consumer level pilot intervention is to increase successful resolution of income DMIs (or direction to report a life change where necessitated) thus allowing consumers to retain their current level of APTC/CSRs and ultimately maintaining enrollment. Measuring return on investment in terms of administrative efficiencies as well as the surveying of the consumer experience are also important secondary goals or objectives. If the results of the pilot are successful and improved outcomes are achieved, the Marketplace could then discuss options for a large scale implementation to more "high risk" consumers, and potentially to the larger population of consumers with income DMIs.

There are multiple options for a more intensive program of outreach and education to assist the "high risk" consumers. For example, a "White Glove" intervention could combine a suite of services designed to help vulnerable consumers. Options include additional 1:1 intervention and walk through of the income DMI process with specialized eligibility support workers provided additional training above the standard, including additional staffing of native Spanish speakers (particularly relevant for cluster 5). A data coordination and exchange effort could flag these consumers for the Marketplace Call Center so when the Call Center received an inquiry from one of these consumers, or a member of the household, they are immediately provided Advanced Resolution Center (ARC) assistance and direct connection with the

eligibility support trained resources. The Marketplace could also deploy additional outreach "touches" in the form of outbound calls, letters, emails and texts, with specialized scripting. These cases could also be flagged for more comprehensive case management and analysis aimed at both assisting the consumer but with the added benefit of providing the Marketplace with additional data on the performance of the outreach effort. For example, for these specialized cases a case record could be established with data collected aimed at monitoring specific outcomes such as response rates, repeated income DMI generation, DMI outcome etc. The preliminary results of the pilot, and multiple data collection efforts associated with the initiative could also be shared with key stakeholders such as advocacy groups, the network of assistor programs, states running their own Marketplaces and issuers to further facilitate assistance to those consumers most at risk. In addition to the above intervention, the Marketplace can provide flagged consumers with additional warning notices, letters and emails.

The Marketplace should also explore additional options for targeted outreach in media outlets such as radio and television by employing the clustering and audience segmentation techniques. For example, previous research demonstrated certain mediums of targeted media intervention, such as radio spots, are effective in reaching underserved populations and are worth of exploration here.[lxxv] In summary, the Marketplace has multiple opportunities to design more targeted interventions in multiple areas including outreach, education and advanced technical assistance based on the results of the cluster analysis. Interventions with goals and objectives aimed at both improved consumer outcomes and data collection will yield the best return on investment as the Marketplace continues to learn more about the consumers served and the impact of robust income verification.

In addition to the above recommendations and in response to the findings of the literature review there are multiple other important areas of needed future inquiry and intervention related to income verification in the Marketplace, briefly summarized here. First, Marketplace consumers require more education about how subsidies work and more tools to make informed decisions about how much subsidy to take in advance, the importance of verifying income and reporting life changes, and the experience at tax

reconciliation. Additional resources are required to assist consumers in comprehending the tax subsidy.[lxxvi] Second, and related to the first, the Marketplace populations most in need of advanced subsidies and the benefits of CSRs likely experience the lowest rates of health literacy. Numerous reports emphasize the need for a sustained public education campaign using demographic data to develop targeted "culturally-appropriate and consumer friendly" materials aimed at assisting enrollment efforts.[lxxvii, lxxviii, lxxix] Specifically, the research points to the need to develop materials about the Marketplace and key health insurance decisions that employ the principles of plain language and provide organization and contextual framing when educating consumers about health insurance.[lxxx]

Third, policy makers must ensure access to appropriate data sources to improve access to real time wage data from sources other than the IRS, such as quarterly wage data to help improve the accuracy of APTC and limit under and overpayment of the tax credits.[lxxxi] Previous work by Stan Dorn at the Urban Institute and Manatt offer attractive options for additional sources of electronic verification, such as the New Hires Database administered by ACF. The Marketplace must continue to investigate, and gain authority where needed, to supplement IRS, SSA and Equifax data for income verification.

Fourth, Marketplace officials, and other stakeholders, must continue to analyze the dynamics of income volatility and family circumstances likely to facilitate a high volume of churning within the Marketplace and Medicaid to limit, as appropriate, the frequency and impact of within coverage year eligibility changes likely to reduce access to coverage and increase consumer confusion.[lxxxii]

Finally, policy officials must take all of these factors into consideration when making key policy decisions about the thresholds used to both generate income DMIs and to resolve income DMIs once generated. The 2016 payment notice takes important strides in this area, but more must be done to make certain the right policy levers are pulled to both maximize enrollment for those who are eligible and improve the consumer experience to continue to make the Marketplace an attractive option.

In conclusion the results of the study provide important insight as to the large volume of Marketplace consumers impacted by the data matching income verification process. The Marketplace Income Verification Data Analysis Framework establishes the foundation for a more robust strategic data plan while also providing results and analysis that are immediately actionable. The demographic statistics, paired with an assessment of consumer Assistor Programs offer a number of opportunities for population level interventions including improvements in the areas of consumer education, technical assistance and stakeholder engagement, as well as highlight where there is significant data collection and analysis still required. The cluster analysis offers an opportunity to immediately pilot a consumer level intervention designed to assist the most vulnerable populations. Optimally, the *Framework* and results provided in this inaugural research establish a sound precedent for achieving the ultimate goal of maximizing enrollment for eligible consumers.

[lxxiv] Ibid. (Graves 2012), (Jacobs 2015)

[lxxv] Boyd, R., Sutton, C., Orleans, T., McClatchey, M., Bingler, R., Fleisher, L., Heller., D., Baum., S., Graves., Ward., J. (1998). Quit today! A targeted communication campaign to increase use of the cancer information service by African American Smokers. *Preventative Medicine*, 27, S50-S-60.

[lxxvi] Ibid. (Jacobs 2013)

[lxxvii] Pollack, R., & Klien, R. (2014). *"Enrollment momentum" accelerating the affordable care acts enrollment momentum 10 recommendations for future enrollment periods.* Families USA.

[lxxviii] Ibid. (Bauhoff, 2013)

[lxxix] Ibid. (Long 2014)

[lxxx] Politi, M., Kaphingst, K., Liu, J., Perkins., H., Furtado., K, Krueter., M., Schacham., E. & McBride., T. (2015) A randomized trial examining three strategies for supporting health insurance decisions among the uninsured. *Medical Decision Making*.

[lxxxi] ibid. (Graves, 2012)

[lxxxii] ibid (Sommers et. al. 2014)

Appendix A: Marketplace Income Verification Data Analysis Framework

Phase I: Descriptive Statistics

Current Day Scenario: 2015 *1.4 M* Adjustments:

***Who* are these Consumers?**

And

What is *actionable* about this Data?

Phase II: Cluster Analysis and Predictive Modeling

Measure Analyze Adapt and Evaluate

2015 Plan Year Data

- Establish baseline data of impacted consumers for measurement and evaluation
- Identify program relevant variables and summary statistics
- Assess available data and adjust data collection approach as needed and ID additional needed information
- Compare DMI activity with available Consumer Assistor Programs

2015 Plan Year Data

1) Identify Meaningful Groupings of Consumers within the large data set

2) Identify the attributes associated with HHs at "High Risk" of losing all APTC

3) Establish a Prediction Model to ID future "High Risk" populations

Population Level Intervention: Future OEPs

- Establish Strategic Data Plan with multiple considerations including additional data collection needs, briefing opportunities, needed coordination across the Marketplace, measurement of operational efficiencies and oversight needs, etc.)
- Measure future plan years against 2015 baseline to assess progress
- Use 2015 baseline data for improved targeted consumer education, technical assistance and improved stakeholder engagement

Consumer Level Intervention: Future OEPs

- Flag Consumers with DMIs who fit the Predictive Model of a "High Risk" Profile
- Pilot Intervention: ID for the Marketplace Call Center, increased technical assistance and consumer touches
- Future scalability to larger consumer population

Long Term Outcome (2016 and beyond):

Increased Resolution of Income Issues and Enrollment Maximization

Jacqueline Roche MHS, DRPH- Baltimore, MD 2016

HEALTH POLICY AND PROGRAM LEADER

Manager, policy advisor and clinician with 15 years of public and private sector experience in a variety of health care settings including international, national and clinical environments. Strategic leader of teams that deliver complex federal policy analysis and recommendations at the highest levels of government and private sectors, including routine briefings to the White House and HHS Office of the Secretary on the implementation of the Affordable Care Act (ACA). Strong analytical skills and strategic direction and demonstrated success in developing and managing the operations of complex projects in high-pressure environments and producing quality, innovative results for decision makers. Ability to recognize, recruit, and develop top talent. Exceptional verbal and written communication, team-building, and negotiation skills. Facility to rapidly develop expertise in new subject areas and provide strategic and tactical insights.

PROFESSIONAL EXPERIENCE

US Department of Health and Human Services 2007 to 2016

Centers for Medicare and Medicaid Services,

Centers for Consumer Information and Insurance Oversight Bethesda

Deputy Group Director, Eligibility and Enrollment

Manage, develop, and perform oversight over multiple programs essential to the implementation of the ACA including manual eligibility verifications for millions of consumers and the Marketplace exemptions process. Lead manager and stakeholder responsible for communicating success of these programs to executive leadership including the HHS Health Secretary and the CMS Administrator. Primary oversight over one of the largest ACA contractor at 1.2 billion dollars and greater than 5000 employees nationally. Collaborate and negotiate with a significant number of high profile stakeholders within the Marketplace and private sector inclusive of the insurance industry, consumer stakeholders and other government officials at both the Executive and Legislative branches.

Direct a staff of lawyers, policy and budget experts to implement and oversee key ACA programs. Manage workloads, assign tasks and projects, recruit and hire personnel, address performance issues, and manage analytic requests from the Office of the Administrator, Secretary and White House. Develop and implement policies and procedures to improve quality, resource allocation, and respond to the needs of newly developing, high profile health insurance Marketplace.

Selected Accomplishments:

- Hired as first Director of the Eligibility Support Branch under the Division of Eligibility and Enrollment, charged with the development and implementation of strategic ACA priorities germane to year one operations including application processing, eligibility verification, consumer communication, and

exemptions processing. Grew team from a staff of three to greater than 10 and acquired one of the largest contracts involved in the implementation of the ACA.

- Direct Eligibility Support portfolio and manage a budget of greater than 1.2 billion over five years. Contract efforts routinely viewed as one of the most successful contractors in delivering exceptional year 1 ACA service and serving consumers well with innovative mitigations and technical solutions to complicated eligibility and enrollment issues.

- Managed large federal and contract staff in year 1, "go-live" operations across five sites nationally, displaying 24-7 "round the clock" leadership in a high-profile, high stakes public program. Successfully led the handling of greater than 400,000 paper applications, solved millions of eligibility issues, processed hundreds of thousands of Marketplace Exemptions and made five million outbound calls during the first Marketplace Open Enrollment period.

- 2014 awards IT POD, Unsung Hero, promotions (2 in two years and quality step)

- Managed the implementation of a high profile mitigation plan to successfully resolve millions of data matching issues for enrolled consumers during the first Open Enrollment Period. Frequently briefed the White House Domestic Social Policy Counsel and Health Secretary Sylvia Burwell during this effort.

- Participate in frequent meetings with multiple internal and external stakeholders in all manners of policy and operations related to the Health Care Marketplace, including the U.S. Congress, the White House, high profile issuer groups, and community advocates.

Branch Manager, Eligibility Appeals **2012 – 2013**

Designed and conducted policy research; wrote analytic papers and legislative, regulatory, and budgetary proposals for the first Marketplace appeals program. Provide technical expertise in strategic planning, evaluation, and in the establishment of a new program for Marketplace appellants. Oversaw a staff of lawyers in developing and evaluation policy papers, budget reports, regulations for policy clearance and negotiated changes with agency officials.

Selected Accomplishments:

- Developed regulatory policy for the inaugural Marketplace Appeals Process in less than five months.

- Engaged with internal and external stakeholders from across government and community advocates to develop a fair and equitable process for Marketplace appeals.

- Led the initial design and operational infrastructure to develop the first Marketplace appeals program in consultation with multiple contractors and vendors.

- Led the year-long effort to develop the Statement of Work (SOW) for the appeals support contractor, one of the largest contracts in the Marketplace.

Rate Review Grants Program Lead, Oversight Group **2010 – 2012**

Established, implemented and managed the inaugural Rate Review Grant Program offered under the Affordable Care Act (ACA). Managed a staff and a budget of $250 million in the oversight of the Rate Review Grant Program.

Selected Accomplishments:

- Architected and established a highly successful inaugural grant program under the ACA in less than two months to "go live" summer 2010. 46 States were successfully awarded $1 million grants during go live.
- Provided leadership and management in the support and provision of technical assistance to 46 states in their efforts to build a more comprehensive and transparent rate review grant program.
- Developed, strengthened and maintained relationships with State partners in the implementation of the ACA.
- Worked with multiple internal and external parties to implement, develop and manage the Rate Review Grant Program, including HHS officials, the White House, and the National Association of Insurance Commissioners (NAIC).
- Lead the policy and programmatic development of Cycle II Rate Review Grants (and future grant program development).

CDC International Experience and Technical Assistance Program Fall 2009

Senior Public Health Policy Analyst

Selected as 1 of 8 HHS employees to participate in a highly competitive US government international capacity development program in public health. Completed overseas assignment with the CDC's Global AIDS Program in Maputo, Mozambique.

Selected Accomplishments:

- Developed a technical assistance resource guide and evaluation tool used in PEPFAR program management deployed across the CDC, State Department, the U.S. Embassy in Maputo and U.S.A.I.D.
- Established a shared technology platform for multiple stakeholders to communicate, strategize and perform accurate program oversight and monitoring; established the platform in multiple languages.
- Participated in site visits to rural counties in Mozambique and assisted in the planning of several high profile HIV/AIDS conferences hosted in Maputo.

Centers for Medicare and Medicaid Services

Office of External Affairs, Intergovernmental Affairs 2009-2010
s
2009 –2010

Selected Accomplishments:

- Lead on intergovernmental relations with the National Association of Insurance Commissioners (NAIC) and the National Association of Budget Officers (NASBO).

- Work collaboratively across CMS on the implementation of both the 2009 Children's Health Insurance Program Reauthorization Act (CHIPRA) and the American Recovery and Reinvestment Act (ARRA). Specific projects to include the convening of stakeholder meetings, presentation development, planning papers, input to outreach campaigns and participation at meetings and conferences.

- Responsible for tracking and providing briefings to OEA leadership on the current health reform discourse.

Centers for Medicaid and State Operations

Division of State Demonstrations and Waivers 2007-2009

- Independently coordinate and lead a team of Federal partners, including the Office of Management and Budget (OMB), to review and approve section 1115 Health Care Reform Demonstrations that aim to develop innovative ways to provide improved access to health care coverage for low income individuals.

- Independently manage and serve as the team lead for the Massachusetts Health Care Reform Demonstration, the largest reform effort of its kind in the nation.

- Compose policy statements for the HHS Secretary and the White House related to the health reform efforts in New England.

PROFFESSIONAL CLINICAL EXPERIENCE 2002-2011
Registered and licensed Occupational Therapist with experience in the direct provision of clinical care in a variety of health care environments including acute care hospitals, psychiatric ER, skilled nursing facilities, home care and school based services.

Selected Accomplishments:

- Completed occupational therapy affiliation in the #1 ranked inpatient psychiatric center in the nation at Massachusetts General Hospital.
- Independently managed a caseload of approximately one hundred students in Southern California covering all of San Diego County, including eight different public schools.
- Perform skilled occupational therapy services including assessments, evaluations, treatments and discharge planning within the home environment in the lower income neighborhoods of Baltimore City.

EDUCATIONAL EXPERIENCE

Johns Hopkins University, **Bloomberg School of Public Health** Baltimore, MD

Doctorate of Public Health, Health Leadership and Policy; pre-doctoral candidate, GPA 3.8

Johns Hopkins University, **Bloomberg School of Public Health** Baltimore, MD

Masters of Health Sciences in Health Policy 09/05-5/07

City University of New York, Joseph S. Murphy Institute New York, NY

Labor Studies Program Fall 2006

Boston University, Sargent College Boston, MA

Bachelor of Science in Occupational Therapy, Minor in Philosophy 09/99-01/03