

APPENDIX A

SUPPLEMENT TO CHAPTER II

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In this appendix we summarize the theoretical predictions of the POD offset on outcomes, including potential differences in outcomes for key subgroups summarized in Chapter II. We develop theoretical predictions of the effect of the new POD offset on outcomes based on a neoclassical economic model that compares the (current law) cash cliff for the control group with the new POD offset ramp for the two treatment groups.

We first focus on the predicted effects of the POD offset rules for those beneficiaries who are most likely to benefit from POD, whom we define as those beneficiaries who are facing the cash cliff under current rules (that is, those who completed the TWP and Grace Period and are able to engage in SGA). This group is a natural starting point because these beneficiaries have a strong incentive to participate in POD given the POD offset includes a new benefit adjustment process that allows some beneficiaries to keep more benefits while working and makes other changes to current rules (e.g., eliminating the TWP).

We then consider other theoretical assumptions to show how other beneficiary subgroups might respond under POD relative to those in current rules. For example, those who are still within the TWP would always be better off under current rules while in the TWP than under POD. We illustrate examples of different scenarios to show changes in incentives. As noted in Chapter III, the BOND experience indicates that a mix of potential beneficiaries might join POD, including those still in the TWP. Consequently, beneficiary responses could vary from the economic model presented for a simple, post-TWP example.

We conclude with a summary of predicted outcomes, which matches the predictions shown in Chapter II. Because of the complexity of the current rules and the heterogeneity of characteristics of the beneficiary population, particularly in regards to completing the TWP (or expectations around completing the TWP), predicted signs for impacts on many outcomes are ambiguous.

A. Neoclassical economic model with a POD volunteer facing the cash cliff under current rules

As a starting point, we show the economic incentives using a neoclassical model of the POD offset compared with current rules for a beneficiary who would be facing a cash cliff under current rules. The neoclassical model shows a labor–leisure trade-off. In this trade-off, every person has a wage, w . The person chooses how to divide his or her time between hours of paid work and hours not at work, termed “leisure” for simplicity, but encompassing all unpaid activities.

Exhibit A.1 shows beneficiary budget constraints—how a beneficiary’s income depends on the number of hours the beneficiary works—under both current law and the POD offset. The exhibit illustrates the type of beneficiary likely to benefit from the POD offset, and therefore likely to volunteer for POD. In particular, we focus on an example of a beneficiary who is not blind; is not eligible for SSI; faces the cash cliff (that is, completed the TWP and Grace Period); has no Impairment-Related Work Expenses affecting countable earnings; and is capable of working enough hours to make the POD offset more desirable relative to current law. The budget constraints and indifference curves will vary among these potential volunteers. We start with an example exhibiting the possible positive impacts of the POD offset on earnings and employment

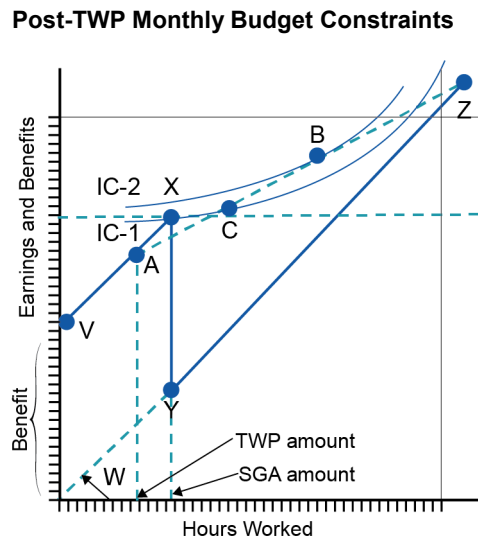
outcomes. Because POD is voluntary, we expect beneficiaries that fall into the categories above will likely volunteer at higher rates than other volunteers, which is an assumption we can directly test in the participation analysis.

We initially simplify other aspects of POD rules so that we can narrow in on predictions for impacts of the POD offset among volunteers. Specifically, we hold constant the main potential effect of the eligibility termination conditions that apply to the second POD treatment group, but not the first. In addition, we hold constant several other factors that might affect impacts. These include the fixed costs of work and the so-called lumpiness of job opportunities; the effects of current work on future earnings; improvements in the functioning of the administrative process for adjusting benefits, primarily due to eliminating the TWP and Grace Period; and taxes.

As a starting point, we compare income differences based on earnings under current rules and the POD offset. We define total income as the sum of SSDI benefits and earnings on the y-axis. To simplify the exposition, we assume the wage rate w equals 1; that is, earnings increases 1 unit for a 1 unit increase in work. If a beneficiary is not working (and thus has no earnings), the beneficiary receives his or her full SSDI benefit—point V on the vertical axis. Under current law, income rises with earnings at a \$1 for \$1 rate until the beneficiary reaches the cash cliff. At low levels of hours worked, the SSDI benefit is unchanged. In this range, total income is the sum of earnings and the full SSDI benefit, and total income increases by w (\$1, in this simplified example) for each hour worked (from points V to point X). Once earnings exceed the cash cliff, the SSDI benefit under current law drops to zero and total income drops to earnings alone (from point X to point Y). The cash cliff begins at the SGA amount after the duration of the Grace Period. For earnings above the SGA amount, total income is equal to earnings—the solid diagonal line from the right of point Y, along which income again increases with earnings at a \$1 for \$1 rate.

Under the POD offset, income also continues to rise with earnings at \$1 for \$1 rate until a person earns up to the TWP amount, but changes after the TWP (POD threshold). The implication is that the current law and POD offset overlap from point V to point A. After the POD threshold, income continuously rises as hours increase beyond point A (where earnings are equal to the TWP amount), past the benefit cliff at point X and up to point Z. This is represented by the dashed line, constituting the POD offset's budget constraint over this range of hours worked. In this range, income increases by \$1 for every \$2 in additional earnings, as the benefit offset reduces benefits by \$1 for every \$2 in earnings above the TWP amount until hours reach the level corresponding to full offset, which is point Z. Thus, the POD offset eliminates the cash cliff.

Exhibit A.1. The post-TWP budget constraints and predicted choices of hypothetical non-blind SSDI-only beneficiary under current law and the POD benefit offset



We have added indifference curves to show beneficiaries’ possible responses to current law and the POD offset. Each point on the indifference curve depicts the combinations of hours worked/income that are equally desirable for a hypothetical beneficiary. We intentionally set the first indifference curve (IC-1) to cross the SGA earnings threshold, point X, to help show a hypothetical beneficiary’s possible response under current law and the new offset above and below the SGA earnings threshold.

The budget constraint under current law creates a strong disincentive to work hours if the corresponding earnings are only modestly larger than the SGA because of the cash cliff, as illustrated by IC-1. In this model, the beneficiary prefers points above and to the left of IC-1 because he or she prefers more income and fewer hours of work. This hypothetical beneficiary is better off at point X than at any other point on the budget constraint under current law. The preferences of this beneficiary are such that, under current law, he or she would not choose to earn more than the SGA amount. Neoclassical theory allows for beneficiaries who are willing to give up their benefits for work under current law; for such a beneficiary, the indifference curves would be flatter, indicating a greater willingness to trade off leisure for higher income.

The POD offset creates new incentives for the hypothetical beneficiary shown in Exhibit A.1 to earn above the SGA amount (at point X), along the dashed portion of the POD budget constraint. We show this point by adding a new indifference curve, IC-2. IC-2 is to the left of IC-1, with higher income for any given level of hours worked. This implies that the beneficiary prefers all points on IC-2 to IC-1. In other words, any point on IC-2 makes the beneficiary better off relative to IC-1.

In summary, the beneficiary depicted in the graph is always better off under POD given the move to a higher indifference curve, which results in positive employment increases and reductions in benefits. Specifically, because this hypothetical beneficiary can now choose hours corresponding to point B on IC-2, he or she would choose to do so under the POD offset.

Compared with the beneficiary's choice of point X under current law, under the POD offset, the beneficiary attains a preferred combination of leisure and income, works more hours, earns more, has lower benefits, and has higher income (that is, the sum of earnings and benefits).

B. Other theoretical considerations

In this section we apply the theoretical model described above to consider examples of beneficiaries with different profiles, including those for whom determining benefits requires more complex information and calculations. The neoclassical model implies that it is possible to identify subgroups of beneficiaries who would not benefit from the POD offset if POD were a mandatory national policy. These groups are important to consider because of the negative implication of the POD offset for their economic well-being if POD rules (i.e., the POD offset and other POD changes, such as the elimination of the TWP) were mandatory. Understanding how the POD offset affects such groups is important because of the implications for interpreting the findings for the evaluation. For example, because POD is voluntary, the number of beneficiaries in these groups who willingly participate in POD is likely to be small relative to their representation in the national population. However, some will likely volunteer, because at the point of POD enrollment they might be optimistic that the POD offset provides them opportunities that are more desirable than those available under current law. Further, if they do volunteer and are assigned to a treatment group, they may revert to current law when they discover that no opportunities under the POD offset are better than those under current law. For symmetric reasons, some beneficiaries who would prefer some opportunities available under the POD offset to all those available under current law might not volunteer for POD.

In this section we also discuss how the POD rules, which includes the POD offset and other POD changes (see Chapter II), could affect behavior in ways that differ from the predictions of the basic neoclassical model. In particular, simplifying the rules could have an effect on employment and earnings behavior that is independent of the financial incentives that underpin the graphical example in the previous section. For example, the experience of BOND volunteers shows that these alternatives are important. Some volunteers in BOND never completed their TWP, though the expectation for BOND, as for POD, was that the volunteers would largely consist of those beneficiaries most likely to benefit from the new earnings rules. Hence, it is important to consider that people might volunteer for POD for reasons other than those of the hypothetical beneficiary above and complicate predictions for the overall beneficiary groups.

Predicted impacts for beneficiaries with different wage rates, benefits levels, or preferences. The predictions associated with Exhibit A.1 depend on the specific indifference curves and budget constraints for individual beneficiaries. Beneficiaries who have sufficiently lower wage rates, benefits, or willingness to give up leisure in exchange for income than the depicted hypothetical beneficiary might find that the POD offset does not provide better opportunities than current law and might be less likely to volunteer. Changing any one of these features graphically by a sufficient amount for the hypothetical beneficiary would result in IC-1 lying entirely above the POD budget constraint. As we will discuss in more detail below, the potential variation in indifference curves based on beneficiary circumstances is important for theoretical predictions.

Earnings below TWP amount. The neoclassical model has implications for the large percentage of beneficiaries whose hours worked are less than the hours corresponding to their TWP amount, *including the majority who do not work at all*. Given their choice under current law, the model implies that the amount they would earn for an hour of work (the slope of their budget constraint at every point except X) is less than the minimum they would be willing to accept for the first hour of work. The latter amount is called their reservation wage, which is the slope of the indifference curve passing through point V (zero hours and earnings) on their budget constraint combined with the neoclassical properties of indifference curves. In other words, based on this model we should not expect more beneficiaries to work under POD rules than do under current law. Following similar reasoning, the model predicts that those who would work under current law but never earn as much as the TWP amount would behave no differently under the POD offset.

Earnings between TWP and SGA amounts. Another feature that distinguishes the POD budget constraint from the current-law budget constraint is that it includes a set of points between TWP hours and SGA hours that are *below* the current-law budget constraint. Holding earnings constant, total income under the POD design is less than it is under current law for any given hours worked within this range. If the POD design were to replace the current-law design for all beneficiaries, the model implies that some beneficiaries who would choose hours worked in this range under current law would be worse off under the POD design. Relative to the depicted hypothetical beneficiary, the wages, benefits, or willingness to enter work in exchange for income for such beneficiaries are such that these beneficiaries would prefer no points on the POD budget constraint with hours worked above SGA hours over the combination of work hours and income they would choose under current law (between points A and X on the current-law budget constraint).

Earnings above SGA. Finally, the neoclassical model predicts that many of those who work enough hours under current law to experience benefit suspension or, eventually, termination will receive a partial benefit under POD, even if they continue to work and earn the same amount. Beneficiaries who would choose a point on their current-law budget constraint between points Y and Z would receive a partial benefit with the POD offset if they work and earn exactly the same amount. The model also predicts that such beneficiaries are likely to reduce their hours and earn less under the POD offset, for two reasons: (1) the increase in their benefit reduces the value of an additional dollar of income, and (2) when their earnings drop by a given amount, their income drops by only half as much as it would under current law. The latter effect also applies to those who would earn just above the point represented by Z under current law. We expect some beneficiaries who would work hours to the right of point Z and thus not receive any benefits under current law would instead reduce their hours under the POD offset enough that they receive a partial SSDI benefit.

Other characteristics affecting predicted impacts. Other beneficiary characteristics are likely to affect impacts for some volunteers, but the same characteristics may mean that few such beneficiaries will volunteer. For example, the treatment of Impairment-Related Work Expenses under the POD design is likely to reduce the likelihood of volunteering among those with high Impairment-Related Work Expenses, other things constant, and could affect how those who do volunteer respond to the POD design (see Chapter III for more details). Similarly, because blind beneficiaries have higher SGA amounts, they are less likely to volunteer, other things constant,

and the behavioral responses of those who do volunteer could differ because of the higher SGA amount (see predictions above for those below SGA).

Predicted impacts of POD termination provisions. A feature of POD that is difficult to show in the neoclassical model is the elimination of the SSDI eligibility termination due to work for the first treatment group. Specifically, this feature of POD could further reduce the uncertainty that beneficiaries face in making work decisions. For example, if POD changes beneficiary perceptions about loss of benefits—even if that perception is incorrect under current law for those in the TWP—POD could lead to employment increases beyond those described above.

Between treatment groups, mean earnings and income will be lower and mean benefit payments higher under the POD offset with termination conditions than they would under the POD offset without termination conditions. This is primarily because some beneficiaries might not want to go through the process of re-entering SSDI if their benefits are terminated for work. More specifically, we predict that, if the termination conditions apply: (1) there will be fewer 12-month periods with no benefits due to earnings; (2) the percentage of beneficiaries earning at least P percent of the smallest earnings amount that results in no benefit payment will be no larger than the corresponding percentage if the termination conditions do not apply; and (3) that any difference in P across groups will increase in magnitude as P approaches 100 percent. We also note that the expedited reinstatement provisions (including provisional benefit payments) that apply for 60 months after termination for work, as under current law, reduce the risk of termination.

C. Summary of predicted effects on primary outcomes

In summary, the predictions for certain subgroups of beneficiaries have clear theoretical predictions, particularly those who face the cash cliff under current rules. Holding all else equal, the theory predicts higher rates of volunteering for POD and more positive earnings impacts for beneficiaries who have completed the TWP and Grace Period, have higher wage rates, have higher monthly benefit amounts, have few or no Impairment-Related Work Expenses, and are not blind.

However, similar to BOND, the predicted signs of impacts for many mean outcomes are ambiguous for the overall population and will depend on the extent to which volunteers comprise beneficiaries from the subgroups most likely to have better economic opportunities under the POD offset. Impacts on earnings are likely to be positive if volunteers predominantly consist of such beneficiaries. Whether or not the earnings impacts for volunteers are positive, they are likely to be more positive than they would be for the full population of SSDI beneficiaries under a mandatory benefit. This is because beneficiaries for whom impacts on earnings are likely to be zero or negative are less likely than others to volunteer.

APPENDIX B

SUPPLEMENT TO CHAPTER III

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Exhibit B.1. Catchment areas for Alabama

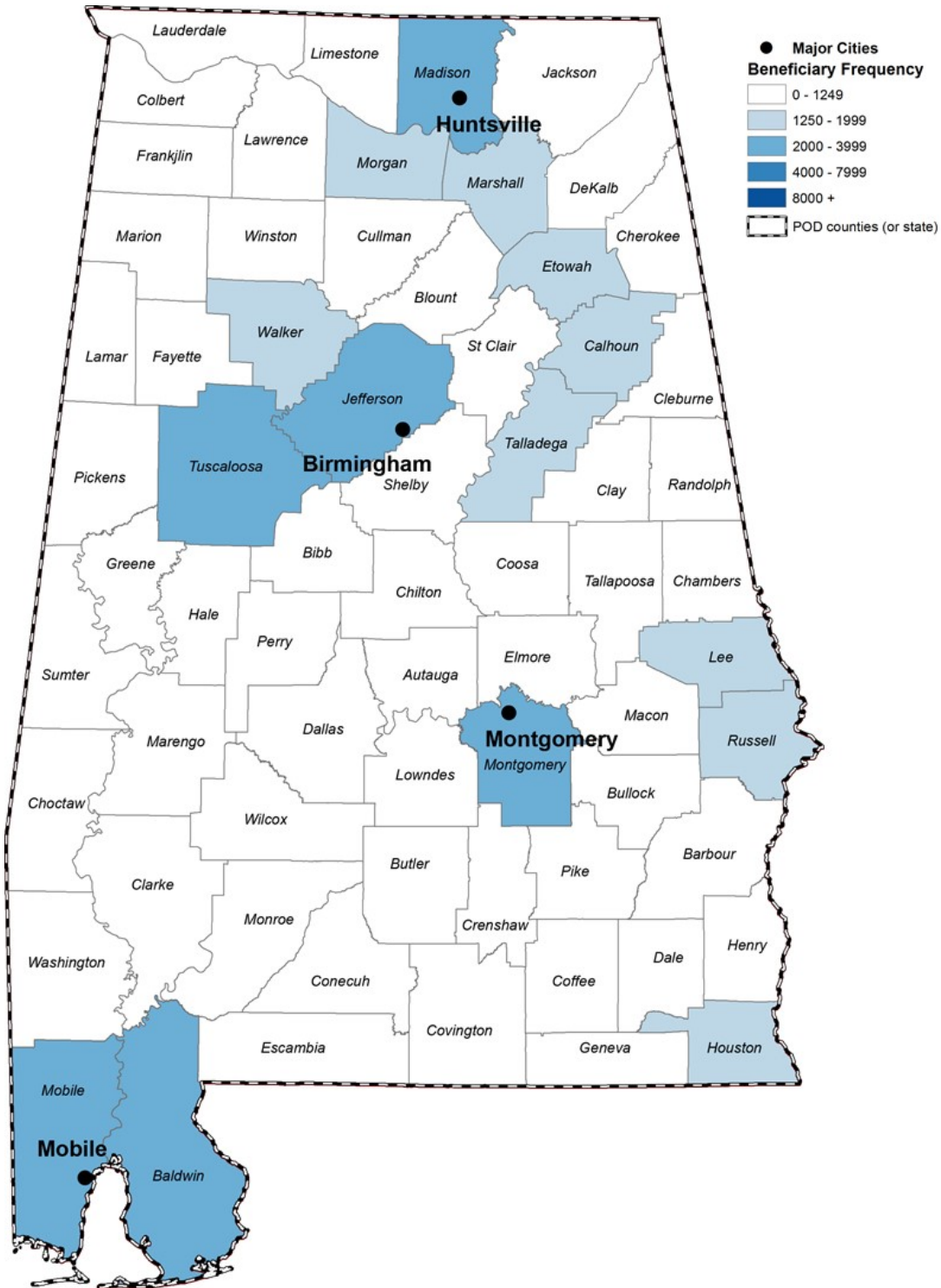


Exhibit B.2. Catchment areas for California

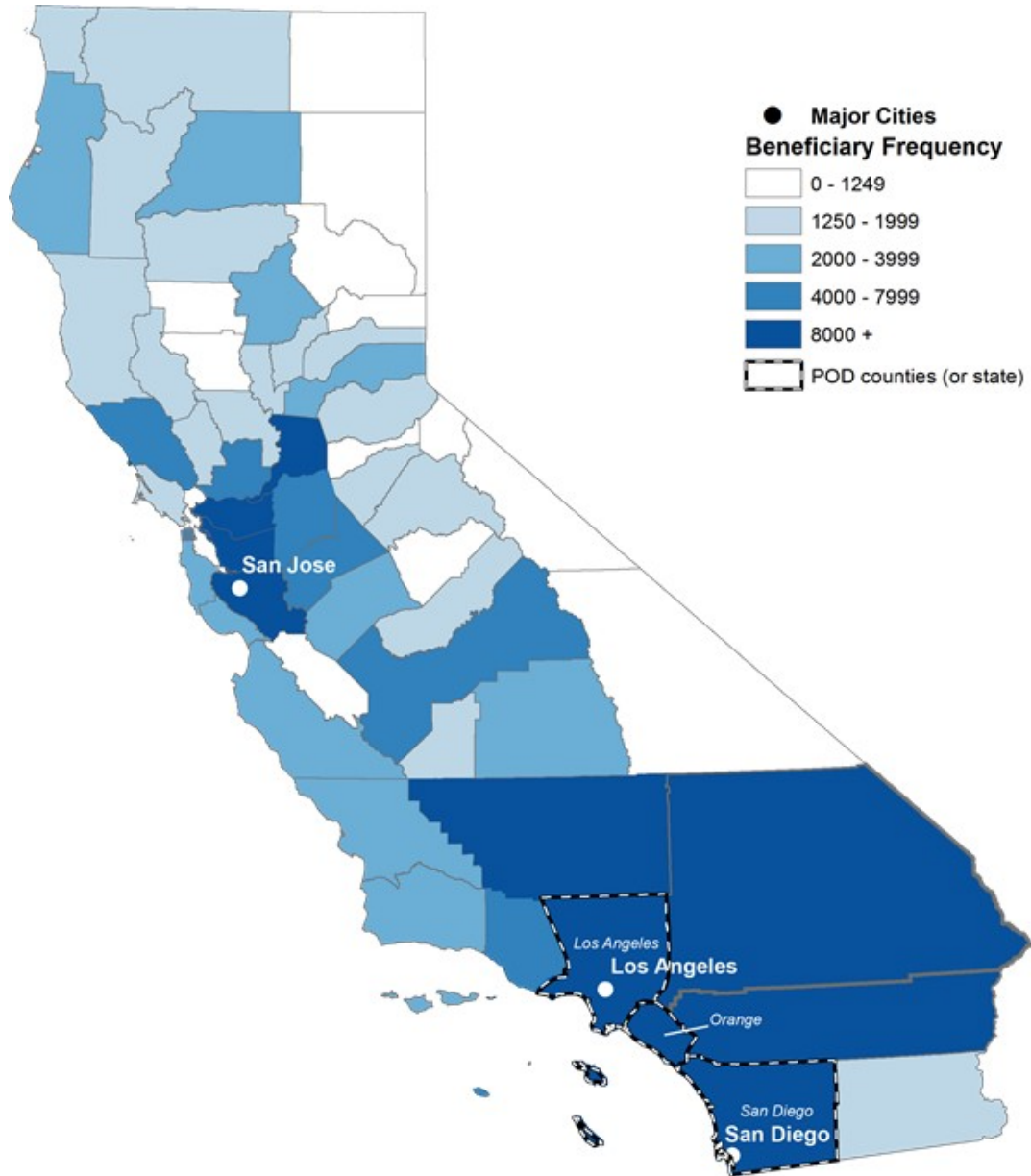


Exhibit B.3. Catchment areas for Connecticut

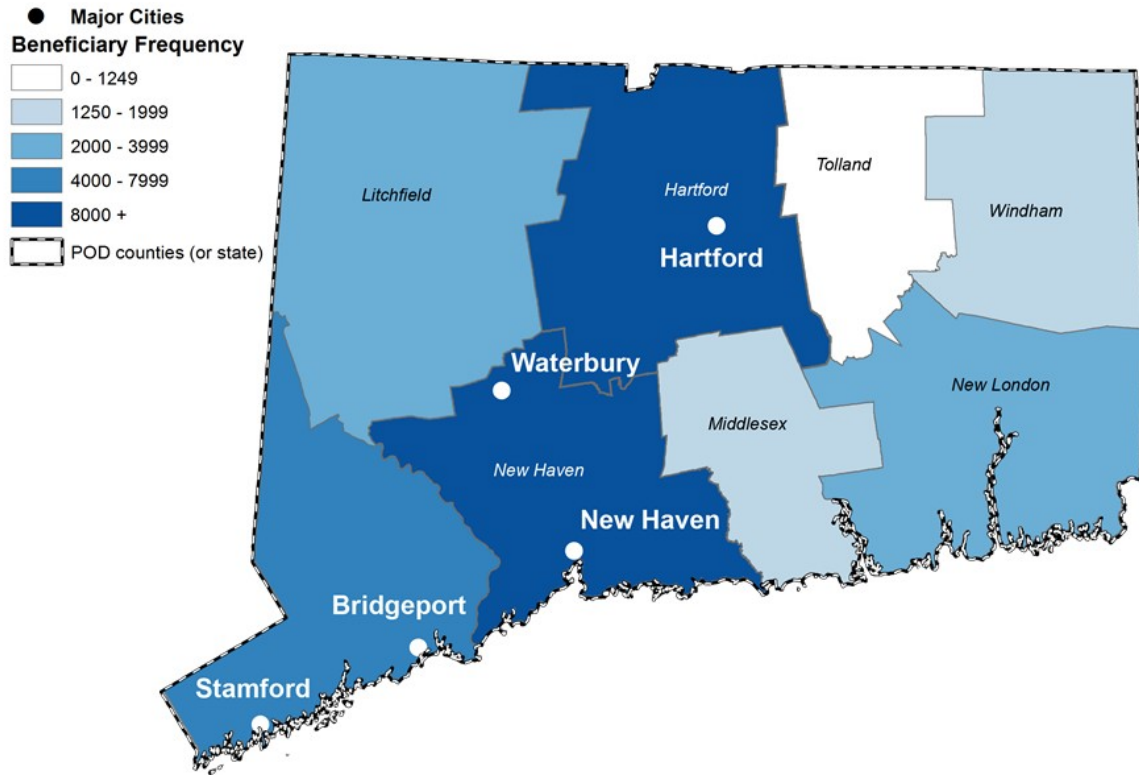


Exhibit B.4. Catchment areas for Maryland

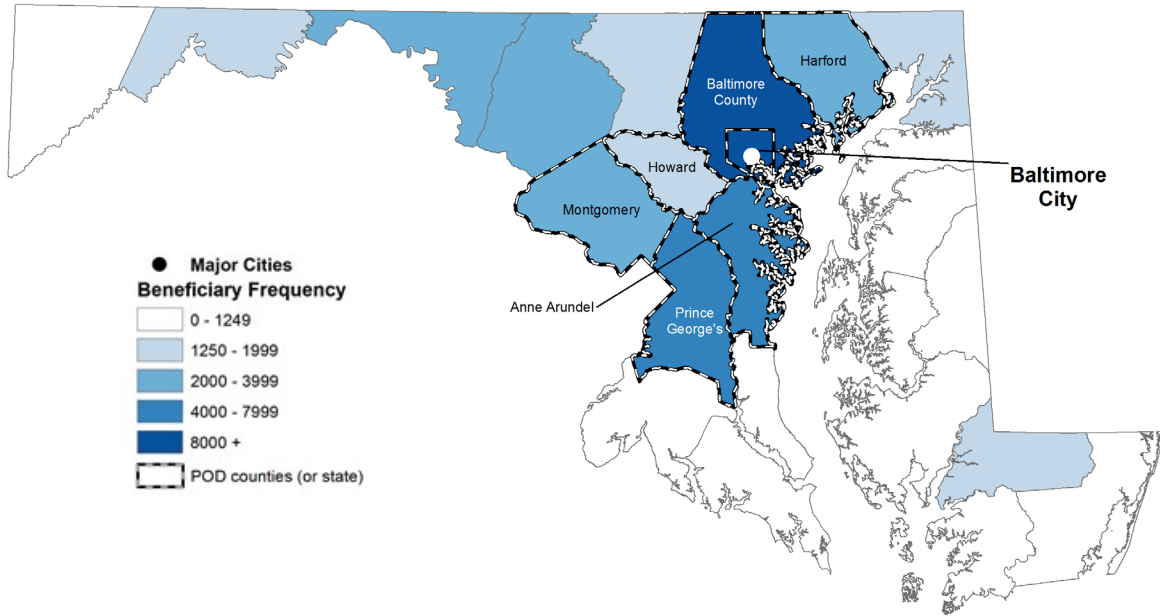


Exhibit B.5. Catchment areas for Michigan

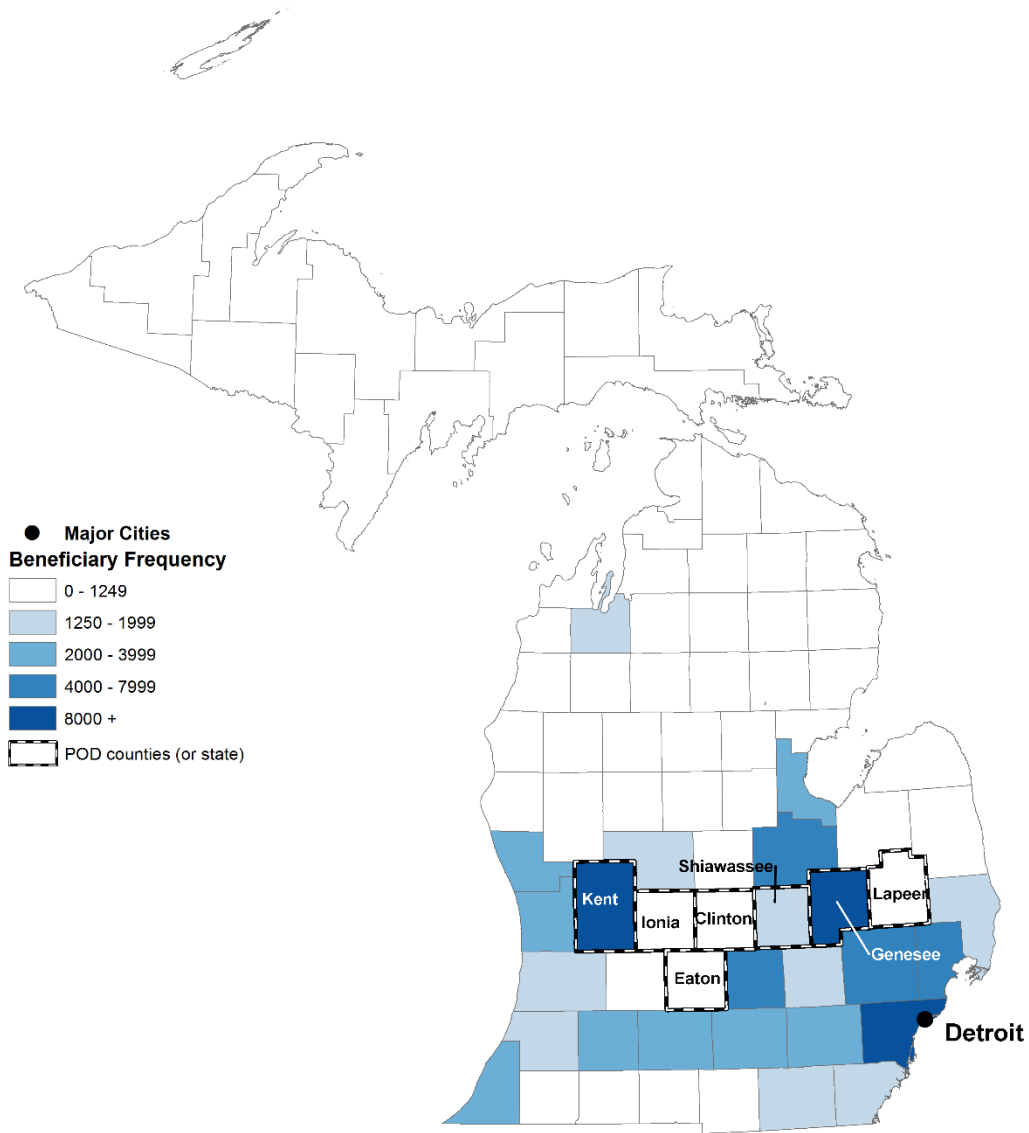


Exhibit B.6. Catchment areas for Nebraska

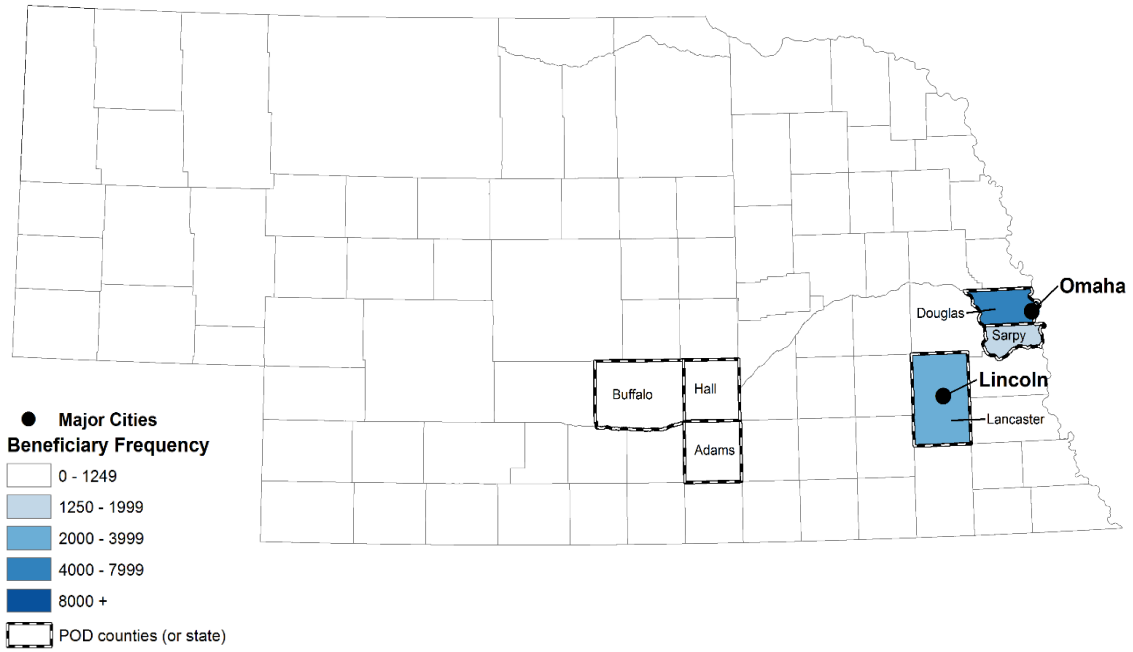


Exhibit B.7. Catchment areas for Texas

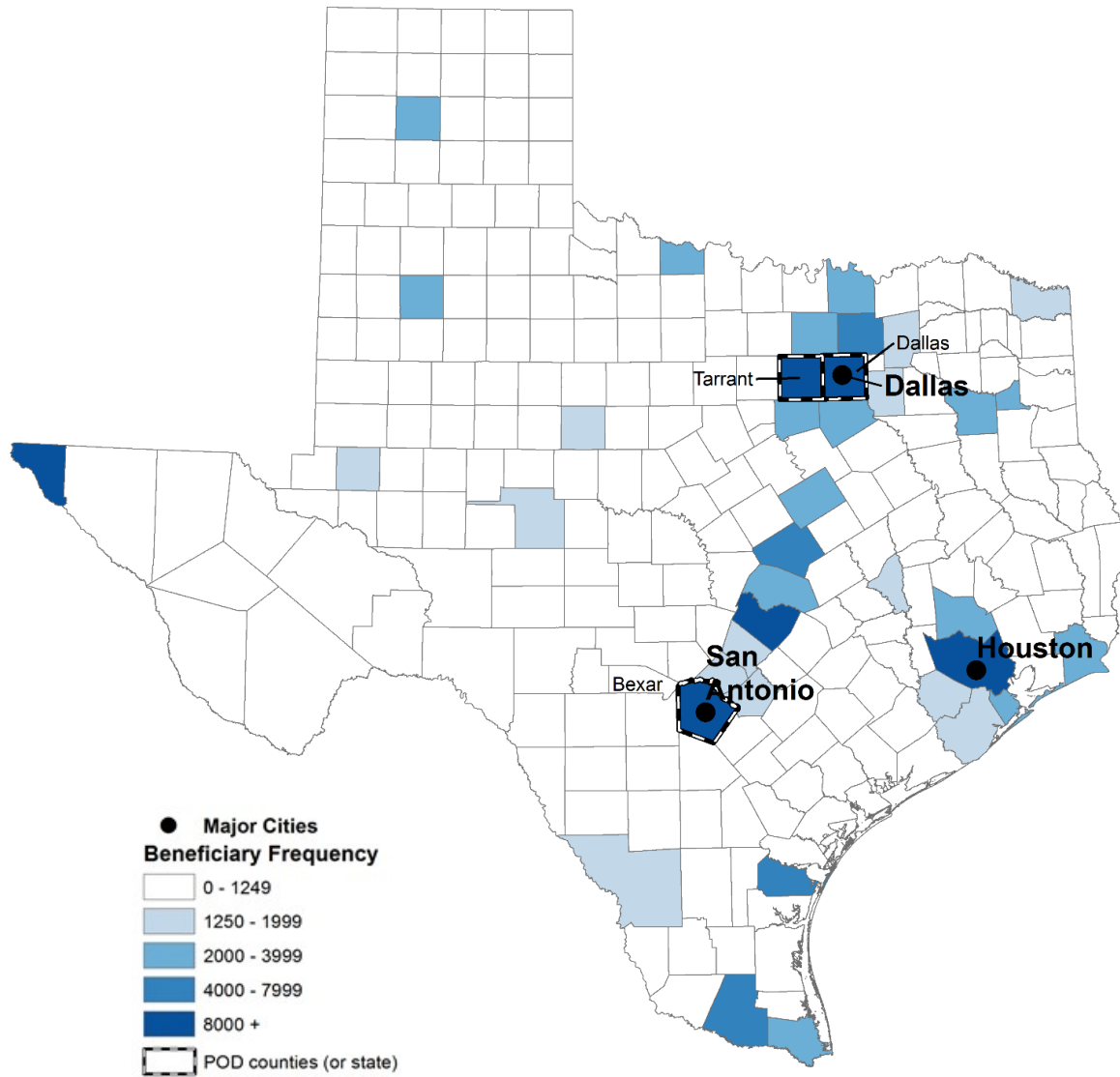
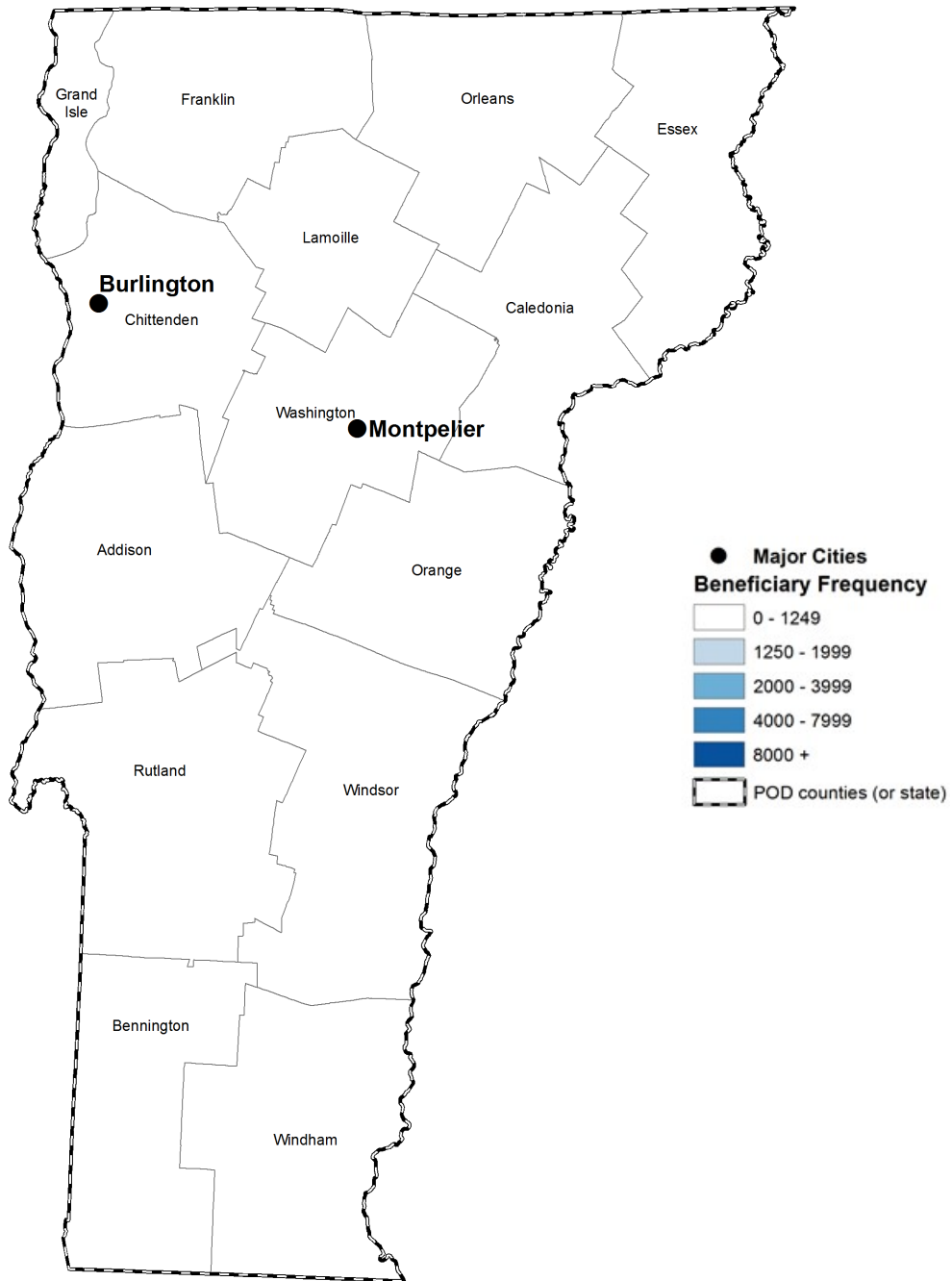


Exhibit B.8. Catchment areas for Vermont



APPENDIX C

SUPPLEMENT TO CHAPTER V

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In this appendix we summarize our plans for conducting site visits. Our proposed site visits will require detailed planning and effective coordination with demonstration partners in each of the POD states (Exhibit C.1). Approximately three months before the first round of site visits in early 2018, the state liaisons will participate in a conference call with the Virginia Commonwealth University site director and VR agency/WIPA manager in each POD state to discuss Mathematica's data collection plans. Shortly after the call, the designated state liaison will send an email to the state VR agency/WIPA provider point of contact for each POD state. The email will describe site visit activities, identify the approximate timeframe for the visit, and request a date for a planning meeting via telephone to discuss the logistics of the site visit and all site visit activities. During the planning meeting with the state VR agency/WIPA provider point of contact, we will discuss the schedule for the visit (for example, length of interviews with each key informant and each informant's role and responsibilities within the organizational structure of the state VR agency/WIPA provider) and learn where each key informant is located within the catchment area. We will also inquire if there are other key stakeholders, such as representatives from the local American Job Center, Centers for Independent Living, or local employment network, who could offer valuable perspectives on the local service context and potentially participate in an interview. After these initial meetings, the state liaisons will follow-up by email and telephone to coordinate logistics for the site visits.

Exhibit C.1. Site visit planning activities

Weeks before site visit	Scheduling activity	Purpose of activity	Demonstration partners involved
12	Participate in a conference call with the POD site director and VR agency/WIPA points of contact	<ul style="list-style-type: none"> • Provide overview of evaluation objectives and site visit data collection plans 	<ul style="list-style-type: none"> • POD site director • Virginia Commonwealth University site liaison • VR agency/WIPA point of contact • Mathematica state liaison
11	Send follow-up email to state VR/WIPA point of contacts	<ul style="list-style-type: none"> • Provide overview of site visit activities • Propose site visit dates • Propose dates/times for planning meeting with VR/WIPA point of contact during week 10 	<ul style="list-style-type: none"> • Mathematica state liaison • VR agency/WIPA point of contact
10	Send advance email to state VR/WIPA point of contact and follow-up by telephone during scheduled meeting time	<ul style="list-style-type: none"> • Provide overview of site visit activities and respondents to participate in interviews • Learn where respondents are geographically located • Identify local stakeholders (American Job Centers, Centers for Independent Living, Employment Networks) who might offer valuable perspectives of local service environment • Review timeframe for data collection • Request program documents 	<ul style="list-style-type: none"> • Mathematica state liaison • VR agency/WIPA point of contact
3-9	Follow-up communication, as needed	<ul style="list-style-type: none"> • Planning and preparation for site visit, including making travel arrangements, tailoring interview protocols, and reviewing background materials 	<ul style="list-style-type: none"> • Mathematica state liaison • VR agency/WIPA point of contact
1-2	Follow up by telephone with state VR/WIPA point of contact	<ul style="list-style-type: none"> • Confirm any information that might have changed • Provide site visitor’s name and contact information • Discuss site visit activities and schedule, including staff interviews and observation of site operations (i.e., benefits counseling sessions) • Review site visit logistics one final time 	<ul style="list-style-type: none"> • Mathematica state liaison • VR agency/WIPA point of contact

A. Pilot testing

For the first round of data collection, we will pilot test the interview protocols by conducting a site visit to California in March 2018. Abt suggested California as the pilot site because it had a relatively high number of enrolled treatment subjects and started implementation early in the pilot period.

The pilot site visit has several important objectives including an assessment of: (1) communication and coordination strategies used with the demonstration VR/WIPA director, POD counselors, VR/WIPA manager supervising the POD counselors, Virginia Commonwealth University TA liaisons, and local VR agency and other stakeholders for planning site visit activities, (2) site visitors' ability to collect the information needed in the allotted time, (3) whether respondents can readily understand and answer the interview questions, (4) whether interviews flow sensibly from topic to topic, and (5) whether the questions yield thoughtful, candid responses. The pilot will also be useful for identifying site visitor training needs. We plan to conduct the pilot site visit in February 2018, the last month of the pilot period, to observe site operations immediately before full implementation in March 2018. The timing of the pilot site visit allows us ample time to modify data collection procedures based on our findings prior to the first round of data collection during full enrollment (expected to begin in late March 2018).

B. Site visitor trainings

Customized, comprehensive training is vital for uniform, consistently high-quality data collection (Exhibit C.2). We will conduct five training sessions corresponding to the following four topics: (1) site visit preparation procedures, (2) conducting the site visits, which will be delivered during two separate trainings, (3) the research objectives, focal research questions, and use of the consolidated framework for implementation research (CFIR), and (4) coding and analyzing the qualitative data. The training pertaining to coding and analyzing qualitative data will be attended by three to four staff who will be part of the coding team. The five state liaisons will attend all other training sessions. The content of the training also will be informed by our pilot site visit described above. The training sessions will review the semi-structured interview guides, the observational guide, and the data coding schemes. We will also practice with role-playing interviews and discuss how to respond to unexpected events while on site. The site visit trainings will facilitate each team member sharing a common understanding of the goals of the site visits and what is expected of them as researchers/site visitors.

C. Site visit summaries

State liaisons will prepare a site visit summary and submit it to SSA within two weeks after each site visit. The summary will follow a standardized template, and will include counts of T1, T2, and C subjects in each site; a summary of Work Incentives Counseling and offset use among T1 and T2 subjects in each site; the local employment, service, and program environment; the organizational structure and staffing configuration in each VR agency/WIPA provider; the processes and procedures that are implemented to support POD; perspectives on facilitators and barriers to implementation; and views on early demonstration outcomes such as POD offset use and delivery of work incentives counseling. The process study task leader of the POD evaluation team will review each site summary to check for internal consistency and completeness of information.

Exhibit C.2. Site visit training topics

Training	Training topics
1. Preparing for site visits	<ul style="list-style-type: none"> • Background on POD • Conducting planning call with demonstration sites • Preparation for site visits, including booking travel, tailoring protocols, recording and transmitting qualitative data
2. Conducting site visits (Delivered in 2 parts)	<ul style="list-style-type: none"> • Overview of demonstration partners implementing POD • Background on respondents, roles, and responsibilities • Review of interview protocols • Review of site visit summary template • Schedule and process for preparing site visit summaries • Overview of SSA security requirements and procedures to follow when collecting and transmitting qualitative data • Discussion of safeguards to maintain firewall between implementation and evaluation teams
3. Use of consolidated framework for implementation research (CFIR)	<ul style="list-style-type: none"> • Introduction to CFIR • How to use CFIR • Review of CFIR domains and constructs • How CFIR is being implemented on POD
4. Coding of qualitative data	<ul style="list-style-type: none"> • Overview of coding schemes • Review of POD logic model • Review of process for coding qualitative data • Review of process for checking coded notes for inter-rater reliability

APPENDIX D

SUPPLEMENT TO CHAPTER VI

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Exhibit D.1. Research Question Codebook

Research Question code	Definition and Coding Rules
1. Pre-POD employment services (provided to SSDI beneficiaries)	Code discussion of employment services provided to SSDI beneficiaries prior to the demonstration, [date]. This can also include discussion of general employment and service environment in the local, state policies, and other state-specific contextual features (i.e., public transit) that could influence benefit offset use during the demonstration; Double code with a program component code. Coding rule: if respondent includes in their description of the local/service environment external factors that influence the implementation of POD Work Incentives Counseling or the POD benefit offset, code that to the appropriate Contextual Factors code.
2. Other services	Code discussion of other government programs, income supports, or services used by POD participants (before, during, or after enrollment in POD); Double code with a program component code.
3. Intervention description	Code neutral description of the POD intervention including delivery of POD Work Incentives Counseling services, what is being implemented in state VR agencies/WIPA provider organizations; Double code discussion of Work Incentives Counseling services with a Work Incentives Counseling program components code; Double code discussion of POD benefit offset with a POD benefit offset program components code. Coding rule: if respondent includes in their description of POD challenges or facilitators to implementing POD Work Incentives Counseling or the POD benefit offset, or a factor that influences the implementation of POD Work Incentives Counseling or the POD benefit offset, code that to the appropriate contextual factors code.
4. POD Infrastructure description	Code description of the POD infrastructure including the components involved in administering or supplying the intervention. Include descriptions of the intake processes to recruit, enroll, and randomize volunteers; the data systems in place to support enrollment of volunteers, service delivery, and site operations; and processes/procedures that support administration of the intervention, including initial training activities and materials. <ul style="list-style-type: none"> • Double code with a program component code.
5. Need for modification	Code discussion of need to change or modify program implementation. <ul style="list-style-type: none"> • Double code discussion of changes to Work Incentives Counseling services or service delivery with a Work Incentives Counseling program components code; changes to the POD benefit offset with a POD benefit offset program components code; or changes to administration of the POD infrastructure with a Pre-Intervention activities or POD data systems program components code. Coding rule: if respondent includes in their description of POD challenges or facilitators to implementing POD Work Incentives Counseling or the POD benefit offset, or a factor that influences the implementation of POD Work Incentives Counseling or the POD benefit offset, code that to the appropriate contextual factors code.
6. Fidelity	Code discussions that relate to whether or not the program is being implemented as planned, including efforts to maintain integrity of random assignment and extent to which POD counseling services are being delivered consistently across some/all sites; Double code with a program component code.
7. Subjects' view of POD	Code discussion of beneficiaries' views on POD; Double code with a Work Incentives Counseling or POD benefit offset program component code.
8. Subject motivation to enroll in POD	Code discussion of the reasons why beneficiaries agreed to enroll in POD; Double code with a Pre-Intervention activities program components code.
9. Subject motivation to withdraw from POD	Code discussion of the reasons why treatment subjects withdrew from POD; Double code with a program component code.

Note: The coding scheme is subject to change as data collection plans are refined further.

Exhibit D.2. Program Component Codebook

Operational code	Definition and Coding Rules
Pre-intervention activities	
1. POD recruitment strategies	Code discussion of strategies that were used to inform SSDI beneficiaries and local stakeholders about POD. Include discussion of four recruitment experiments the evaluation team is testing under POD.
2. POD enrollment and random assignment processes	Code discussion of processes and data systems supporting enrollment and randomization of participants. Include discussion of baseline survey and informed consent.
Work incentives counseling	
3. Onboarding new subjects (intake procedures)	Code discussion of POD counselors using the (standardized) intake protocol to onboard new subjects and collect necessary information.
4. Collecting and reporting monthly earnings to SSA (and coordinating earnings and impairment-related work expenses)	Code discussion of POD counselors working with treatment subjects on their monthly earnings and Impairment-Related Work Expenses reporting and reconciling the earnings and Impairment-Related Work Expenses information that is reported.
5. Assisting treatment subjects with requests for appeals/waivers	Code discussion of POD counselors assisting treatment subjects with appeals or waivers in response to changes made to their benefits payments.
6. Developing benefits summary and analyses (benefits planning query analysis and benefits verification)	Code discussion of POD counselors summarizing case-specific information about the past, current (at on-boarding), and future use of work incentives that support a treatment subject’s work and earnings goal, including: <ul style="list-style-type: none"> • Confirming and summarizing all the federal and state benefits the subject is receiving that could be affected by paid employment. This might include assisting subjects to obtain Benefits Planning Queries and other benefits verification • Confirming and summarizing the subject’s current employment or earnings goal(s) • Assessing and documenting how the subject’s specific earnings goal(s) will affect all benefits the subject receives • Identifying the specific work incentives applicable to the subject • Recommending employment services that could help the subject achieve their specific earnings goal(s) • Options for resolving any benefit issues • Include discussion of initial benefits summary and analyses and revisions to benefits summary and analyses.
7. Developing work incentives plans	Code discussion of the POD counselor using the recommendations and choices in the benefits summary and analyses to collaborate with the treatment subject to develop an individualized plan, or “to-do” list, for using work incentives to further the subject’s financial independence goals. Include discussion of initial work incentives plan and revisions to work incentives plans.

EXHIBIT D.2. (CONTINUED)

Operational code	Definition and Coding Rules
8. Delivering ongoing POD work incentives counseling	<p>Code discussion of POD counselors providing ongoing work incentives counseling to treatment subjects, including:</p> <ul style="list-style-type: none"> • Providing information and explanation of the POD offset and rules to subjects • Helping subjects make choices about their employment and earnings that meet their career and self-sufficiency goals (in their work incentives plan). • Assisting subjects to access services and supports necessary to achieve their self-sufficiency goals • Referring subjects to employment services. • Referring subjects to employment supports. Helping subjects to understand the effect of various employment choices on their benefit eligibility and payment amount (related to benefits summary and analyses) • Supporting subjects when earnings totals vary month to month therefore changing the offset frequently, and resulting in benefits over- or underpayments. (This might overlap with assisting participants (POD subjects) with requests for appeals/waivers) • Counseling on state-specific benefits, such as state supplements and Medicaid for working subjects • Counseling on Expedited Reinstatement, available to subjects whose entitlement is terminated due to earnings (explaining the Expedited Reinstatement process and assisting them to apply for Expedited reinstatement).
9. Supporting diverse and underserved populations	<p>Code discussion of POD counselors delivering culturally sensitive services to treatment subjects with the following content:</p> <ul style="list-style-type: none"> • Diverse racial, ethnic, and gender background: Focused on treatment subjects from diverse racial heritage, and various ethnicities. • Diverse linguistic backgrounds: Developed language appropriate to English language learners, non-English speakers, or other beneficiaries who may need translation services or accommodations. • Specific disability categories: Taking into account the unique needs of beneficiaries with various types of disabilities. • Specific accommodation needs: Addressing the needs for various types of accommodations that will enable participants to access and benefit from all POD work incentives counseling and POD Call Center services, including communications, written materials, and technology, in order to benefit from services. • Underserved groups: Addressing the needs of typically underserved populations, such as transition-aged youth; veterans; Native Americans and other racial, ethnic, disability, or socioeconomically disadvantaged groups; or participants in rural or urban areas.
10. Transitioning treatment subjects out of POD	<p>Code discussion of treatment subjects transitioning out of POD, including:</p> <ul style="list-style-type: none"> • Using an off-boarding checklist • Providing POD counseling to treatment subjects about returning to current program rules.
POD data systems	
11. Using the MIS	Code discussion of using management information systems to collect POD related data.

EXHIBIT D.2. (CONTINUED)

Operational code	Definition and Coding Rules
POD benefit offset	
12 Monthly reporting of earnings and Impairment-Related Work Expenses	<p>Code discussion of treatment subjects monthly reporting of earnings and Impairment-Related Work Expenses to POD, including:</p> <ul style="list-style-type: none"> • Identification of subjects with earnings over POD threshold who need to report earnings each month • Instrument (POD Monthly Earnings and Impairment-Related Work Expenses Reporting Form) used to collect monthly earnings and Impairment-Related Work Expenses information from eligible treatment subjects • Modes for submitting earnings and Impairment-Related Work Expenses information (mail, fax, IDS, and in-person) to POD • Timeliness of monthly reporting of earning and Impairment-Related Work Expenses (from beneficiary to Abt and from Abt to SSA) • Processes in place to support collection of monthly earnings information (i.e., quarterly reminder letters, monthly email or text reminders, etc.)
13 Processing earnings and Impairment-Related Work Expenses information	<p>Code discussion of processing of treatment subjects' earnings and Impairment-Related Work Expenses information submitted to POD, including:</p> <ul style="list-style-type: none"> • Scanning and uploading of earnings and Impairment-Related Work Expenses information to IDS • Creation and quality review of earnings records in IDS • Processes to follow-up with subjects to address identified issues • Submission of earnings records to SSA
14. Adjusting DI benefits under POD offset rules	<p>Code discussion of adjusting DI benefits under POD offset rules, including:</p> <ul style="list-style-type: none"> • Adjustment in monthly benefit payments under POD offset rules • SSA notices explaining changes in DI benefit payments • Overpayments, underpayments, and incorrect payments resulting from monthly benefit adjustments • Benefit termination under POD rules due to work and earnings. Applicable to T2 subjects only.
15. Annual automated reconciliation	<p>Code discussion of automated reconciliation that SSA runs annually in August for the previous year to identify the correct amount of benefits that should have been paid to each subject under POD offset rules.</p>

Note: The coding scheme is subject to change as data collection plans are refined further.

Exhibit D.3. Contextual Factors Codebook

Contextual Code	Definition and Coding Rules
A. Characteristics of the intervention (Administration of POD offset and provision of POD work incentives counseling)	
1. Evidence strength & quality	Stakeholders' perceptions of the evidence supporting the belief that the intervention will have desired outcomes.
2. Relative advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
3. Adaptability	The degree to which the intervention can be adapted, tailored, refined, or reinvented to meet the needs of the VR agency/WIPA provider, POD call center, or indirect support units (e.g., POD processing center).
4. Trial	The ability to test the intervention on a small scale in the VR agency/WIPA provider, and to be able to reverse course (undo implementation) if warranted.
5. Complexity	Perceived difficulty of implementation, reflected by duration, scope, disruptiveness, complexity, and number of steps required to implement.
6. Presentation of intervention	Perceived excellence in how the intervention is explained and presented to those implementing it. Example: POD counselors' perceptions of procedural manuals, and other documents explaining operational processes.
7. Cost	Costs of the intervention and costs associated with implementing that intervention including investment, supply, and opportunity costs.
B. State-specific contextual features	
1. Participant needs & resources	The extent to which participant lacks resources (e.g., employment support needs, accessibility needs, etc.) and barriers and facilitators to meet those needs.
2. External networks	The degree to which the VR agency/WIPA provider is networked with other external organizations.
3. Peer pressure	Competitive pressure from another organization (e.g., other VR agency, Employment Network, WIPA provider) to implement the intervention.
4. External policy & incentives	A broad construct that includes external strategies to spread interventions including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, collaborative.
C. Internal context of state VR agency/WIPA provider	
1. Structural characteristics	Organizational characteristics (i.e. accessibility for people with disabilities), age, maturity, and size of an organization. Also include the type of entity implementing POD (VR agency, WIPA provider, lower tier subcontractor), discussions of the management structure supporting POD implementation, or approach to service delivery.

EXHIBIT D.3. (CONTINUED)

Contextual Code	Definition and Coding Rules
2. Networks & communications	The nature and quality of social networks within an organization and the nature and quality of formal and informal communications among POD staff working within the VR agency/WIPA provider or Abt support units.
3. Culture	Norms, values, and basic assumptions of the VR agency/WIPA provider or Abt support units.
4. Implementation climate	The capacity for change, shared receptivity of involved individuals to an intervention and the extent to which use of that intervention will be rewarded, supported, and expected within their organization (i.e., VR agency/WIPA provider or Abt support units).
a. Tension for change	The degree to which stakeholders perceive the pre-POD WIPA services or SSA work incentives under current DI program rules as needing change.
b. Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals; how those align with individuals' own norms, values, and perceived risks and needs; and how the intervention fits with existing workflows and systems.
c. Relative priority	Individuals' shared perception of the importance of the implementation within the organization (i.e., VR agency/WIPA provider or Abt support units).
d. Organizational incentives & rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary and less tangible incentives such as increased stature or respect.
e. Goals & feedback	The degree to which demonstration goals are clearly communicated, acted upon, and fed back to POD counseling and support staff and alignment of that feedback with goals.
f. Learning climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.
5. Readiness for implementation	Tangible indicators of organizational (i.e., VR agency/WIPA provider) commitment to its decision to implement an intervention.
a. Leadership engagement	Commitment, involvement, and accountability of POD Implementation leaders and managers overseeing implementation.
b. Available resources	The level of resources dedicated for implementation and on-going operations including money, training, staffing, equipment, education, physical space, and time.
c. Access to knowledge and information	Ease of access to information and knowledge about the intervention and how to incorporate it into work tasks.

EXHIBIT D.3. (CONTINUED)

Contextual Code	Definition and Coding Rules
D. Characteristics of individuals implementing the intervention (POD counselors, POD managers, and POD indirect and direct support staff)	
1. Knowledge & beliefs about the intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention. Example: [Believe that DI beneficiaries' receipt of accurate and complete information about work supports and work incentives will allow them to make informed decisions about working and increasing their earnings.]
2. Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.
3. Individual stage of change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.
4. Individual identification with the organization	A broad construct related to how individuals perceive the organization (i.e., VR agency/WIPA provider or Abt Associates for the POD support units) and their relationship and degree of commitment with that organization.
5. Other personal attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.
E. Implementation process	
1. Planning	The degree to which a purposeful method and tasks for implementing an intervention are developed in advance and the quality of those methods. Include discussion of activities related to staff training, planning for implementation, and early implementation activities during the pilot period. Do not include training activities that occur after implementation begins.
2. Engaging	Attracting and involving POD implementation staff in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.
a. Opinion leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.
b. Formally appointed internal implementation leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention, such as POD counselors, POD managers, or other similar role.
c. Champions	"Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]" [101](p. 182), overcoming indifference or resistance that the intervention may provoke in an organization.

EXHIBIT D.3. (CONTINUED)

Contextual Code	Definition and Coding Rules
<p>d. External change agents – technical assistance provided by Abt, Virginia Commonwealth University, and SSA</p>	<p>Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.</p> <p>The Virginia Commonwealth University Site Liaisons will be responsible for monitoring the performance of the POD sites and delivering technical assistance when they identify a need.</p> <p>Code discussion of the technical assistance provided by Abt and Virginia Commonwealth University and site monitoring. SSA and Abt will also provide policy and operational guidance that will alter/influence how the intervention is implemented. Code discussion of policy or operational guidance provided by SSA or Abt Associates.</p>
<p>3. Executing</p>	<p>Carrying out or accomplishing the implementation according to plan.</p>
<p>4. Reflecting & evaluating</p>	<p>Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.</p>
<p>5. Training and/or unmet training needs</p>	<p>Use the staff-specific codes to capture discussion of POD training or unmet training needs for each type of staff.</p>
<p>a. VR/WIPA manager training</p>	<p>Code discussion of VR managers receiving:</p> <ul style="list-style-type: none"> • 8 hours of training on the basic POD design and procedures, referred to as POD 101. • POD IDS User Training, including both general information on using IDS and customized training on role-based functionality.
<p>b. POD counselor training</p>	<p>Code discussion of POD counselors receiving:</p> <ul style="list-style-type: none"> • 8 hours of training on the basic POD design and procedures, referred to as POD 101. • 32-hours of training focused on POD benefits rules to prepare counselors to explain the unique rules in place for POD and the requirements for its two treatment groups • Counselors who are not Certified Work Incentives Counselors attending a comprehensive initial Certified Work Incentives Counselor training and certification course, approximately 200 hours. • POD IDS User Training, including both general information on using IDS and customized training on role-based functionality • NOTE: The Certified Work Incentives Counselor training requirements have been relaxed for POD counselors working in the Maryland POD site. Code discussion of the training that POD counselors in Maryland have received prior to and during implementation of POD.

EXHIBIT D.3. (CONTINUED)

Contextual Code	Definition and Coding Rules
c. Abt call center training	<p>Code discussion of training call center staff receiving:</p> <ul style="list-style-type: none"> • 8 hours of training on the basic POD design and procedures, referred to as POD 101 • Detailed role-based trainings to prepare them to assist POD callers; the Abt team will provide this training • POD IDS User Training, including both general information on using IDS and customized training on role-based functionality
d. Mathematica toll-free specialist training	<p>Code discussion of training Mathematica toll-free specialists receiving, provided by Mathematica operations staff.</p>
e. POD support team training	<p>Code discussion of support teams receiving:</p> <ul style="list-style-type: none"> • 8 hours of training on the basic POD design and procedures, referred to as POD 101 • POD IDS User Training, including both general information on using IDS and customized training on role-based functionality
f. Mathematica recruitment staff training	<p>Code discussion of training Mathematica recruitment staff receiving:</p> <ul style="list-style-type: none"> • Detailed role-based training to prepare them to assist POD callers; the Mathematica survey team provide this training. • Refresher role based training delivered right before the start of recruitment.
g. Social Security processing staff training	<p>Social Security staff training</p> <ul style="list-style-type: none"> • Detailed role-based training to prepare them to adjust treatment subjects' SSA administrative records under POD rules; SSA will provide this training. • POD Automated System training.
6. Competency-based Certified Work Incentives Counselor certification	<p>Code discussion of the competency-based certification and its three components:</p> <ul style="list-style-type: none"> • Component 1 – Knowledge Assessment • Component 2 – Case Study Exercise • Component 3 – Benefit Summary and Analysis

EXHIBIT D.3. (CONTINUED)

Contextual Code	Definition and Coding Rules
<p>Technical assistance (TA) and/or unmet TA needs</p>	<p>Code discussion of TA provided by Virginia Commonwealth University, Abt, and SSA; or any unmet TA needs.</p> <p>The Virginia Commonwealth University Site Liaisons will be responsible for monitoring the performance of the POD sites and delivering TA when they identify a need. Code discussion of the TA provided by Abt and Virginia Commonwealth University and site monitoring, including:</p> <ul style="list-style-type: none"> • Site-specific case reviews (discussing difficult cases as a group) • One-on-one case reviews with individual counselors • File audits of individual participants • TA plans • National video conference calls • Site visits <p>SSA and Abt will also provide policy and operational guidance that will alter/influence how the intervention is implemented. Code discussion of policy or operational guidance provided by SSA or Abt Associates.</p> <ul style="list-style-type: none"> • Double code with relevant Program Component code.

Note: The coding scheme is subject to change as data collection plans are refined further.

Exhibit D.4. Indicators of implementation context and fidelity of staffing and service delivery in YYYY

Indicator	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	All Sites Combined
Staffing									
Number of work incentives counselors on staff									
Percent work incentives counselors certified at time of hire									
Average number of years since Certified Work Incentives Counselor certification obtained									
Average caseload per full time equivalent work incentives counselor									
Percent of full time equivalent work incentives counselors assigned participants in only one treatment group									
Number of work incentives counselors who have left their position since program began									
Trainings delivered to work incentives counselor staff									
Number of trainings delivered to POD staff									
Percent trainings delivered in-person									
Percent trainings delivered virtually									
Percent trainings self-directed									
Remote service delivery									
Percent of counseling sessions occurring remotely									
Percent of treatment subjects receiving more than half of counseling sessions remotely									

Note: The measures are subject to change as design and data collection plans are refined further.

Exhibit D.5. Indicators of implementation context and fidelity of work incentives counseling in YYYY

Indicator	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	All Sites Combined
Onboarding of new treatment subjects									
Average amount of time to first work incentives counselor contact attempt									
Percent of subjects reached by a work incentives counselor									
Percent of subjects reached by a work incentives counselor who opt out of counseling services									
Develop benefits summary and analyses and work incentives plan									
Percent of clients with benefits planning query before benefits summary and analyses									
Percent of all clients with a benefits summary and analyses									
Percent of employed clients with a benefits summary and analyses									
Percent of clients with an employment goal with a benefits summary and analyses									
Percent of non-working clients without employment goals with a benefits summary and analyses									
Percent of all clients with a work incentives plan									
Percent of employed clients with a work incentives plan									
Percent of clients with an employment goal with a work incentives plan									
Percent of non-working clients without employment goals with a work incentives plan									
Average duration between work incentives plan delivery and next contact									
Deliver ongoing work incentives counseling									
Average number and duration of contacts per work incentives counselor client last quarter									
Average number of e-mail contacts per client									
Average number of phone or in-person contacts per client									
Average duration of contacts per client									
Average number of employment-support referrals last quarter									
Average number of employment-service referrals last quarter									
Average number of referrals to Employment Network									
Average number of referrals to VR									
Average number of referrals to American Job Center									
Percent with benefit adjustment who received counseling within one month of initial benefit adjustment under POD									

Note: The measures are subject to change as design and data collection plans are refined further.

Exhibit D.6. Indicators of implementation context and fidelity of transitioning participants out of POD in YYYY

Indicator	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	All Sites Combined
Percent of participants who transitioned out of POD									
Percent who transition out of POD because participant requested to withdraw									
Percent who transition out of POD because of medical termination									
Percent who transition out of POD because participant is ineligible									
Percent who transition out of POD because of T2 POD earnings termination									
Percent who transition out of POD for some other reason									
Percent of subjects who transitioned out of POD contacted within specified time frame									
Percent of T2s with POD earnings termination contacted within 4 months of scheduled end date									
Percent of withdrawn subjects with transition completed by indicated date									

Note: The measures are subject to change as design and data collection plans are refined further.

Exhibit D.7. Indicators of implementation context and fidelity of benefit adjustment in YYYY

Indicator	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	All Sites Combined
POD Benefit Adjustment									
Percent of subjects known to be in POD offset as of October YYYY									
Percent in POD offset with full benefit offset in October YYYY									
Percent in POD offset receiving less than 50% of full benefit amount in October YYYY									
Percent in POD offset receiving 50-75% of full benefit amount in October YYYY									
Percent in POD offset receiving more than 75% of full benefit amount in October YYYY									
Annual Benefit Reconciliation									
Percent who used the POD offset in YYYY with complete end of year reconciliation documentation submitted timely to SSA									
Percent of YYYY POD offset users who were overpaid in that year									
Percent of YYYY POD offset users who were correctly paid in that year									
Percent of YYYY POD offset users who were underpaid in that year									
Benefit Adjustment Appeals									
Percent of beneficiary-offset months in YYYY for which beneficiaries filed reconsiderations to dispute monthly offset adjustment									
Average time from monthly reconsideration filing to resolution									
Percent of monthly reconsiderations leading to adjustments									
Percent of beneficiaries who used the offset in YYYY who filed reconsiderations to dispute annual adjustment									
Percent of annual reconsiderations leading to adjustments									
Average time from annual reconsideration filing to resolution									

Note: The measures are subject to change as design and data collection plans are refined further.

APPENDIX E

SUPPLEMENT TO CHAPTER VIII

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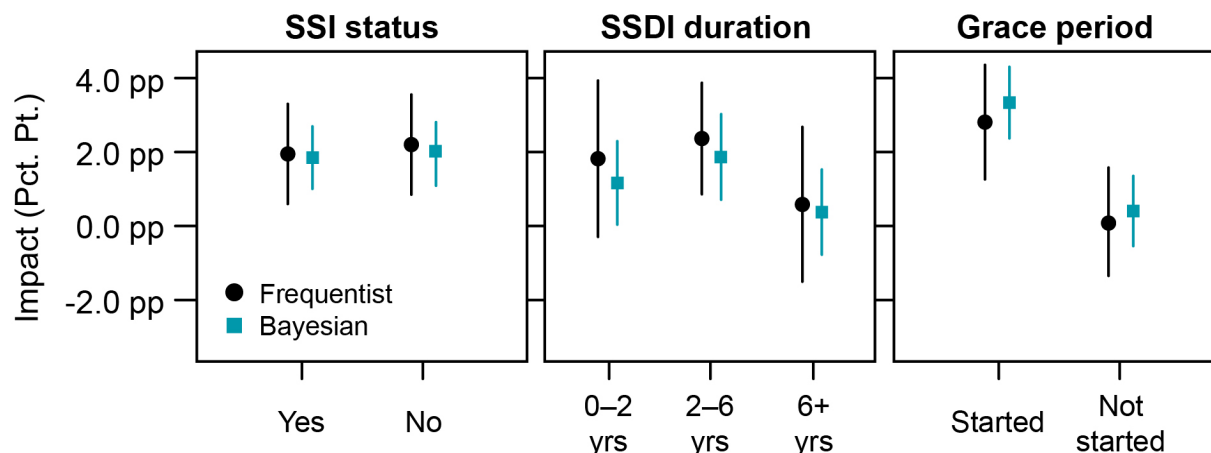
A. Bayesian options for special topic reports

The limitations of traditional, frequentist approaches to subgroup analyses stem from how the standard regression approach is implemented: we can account for some similarities between subgroups through the covariates (X_i), but we otherwise estimate essentially separate impacts for each subgroup. For a special topics report, we plan to explore a Bayesian approach that addresses these issues. The Bayesian approach addresses these limitations by partially pooling information—or borrowing strength—across subgroups. This unified approach will enable us to produce subgroup impact estimates that are more precise and predictive (Gelman et al. 2014); borrowing strength reduces the mean-square error of each subgroup impact estimate.

The potential gains in inference from using a Bayesian framework come at the cost of added assumptions, but we think that these assumptions needed for the POD subgroup analyses are relatively mild. Specifically, the Bayesian framework requires leveraging prior information to achieve better estimates. For the proposed subgroup analyses, we need to simply specify that the impact for younger beneficiaries has *some* correlation with the impact for older beneficiaries, which enables us to borrow information across the groups. We do not specify the exact degree of that correlation. Instead, we estimate it using what we observe for POD subjects, thereby letting the data dictate the extent to which, say, what we find for older beneficiaries influences our impact estimates for younger beneficiaries. We could also refine this approach by (1) specifying that the degree of correlation differs across different subsets of the POD subject pool (to the extent established by the data) and (2) establishing a bound on the likely range of subgroup impacts. The latter assumption would reduce the influence of an outlier result.

In the special topics report, we would present the Bayesian subgroup impact estimates and confidence intervals alongside the main (frequentist) estimates to show how the different approaches change the estimates, precision, and conclusions. Exhibit E.1 illustrates, with fabricated data, how we would present such estimates for subgroups defined by SSI status, SSDI duration, and Grace Period status.

Exhibit E.1. Comparing Bayesian and frequentist subgroup impact estimates for substantive employment (illustrative examples)



Source: SSA program data and baseline survey.

B. Estimating the probability that the intervention is truly effective when the estimated impact is statistically significant

To inform policy, we would like to use the impact findings to state the likelihood that the intervention is truly effective. As discussed in Chapter VIII, researchers sometimes misinterpret the p -value as the probability that the true impact is zero, given what we observe in our data. However, we can draw on information from other studies to estimate such a probability. To do this, we have to know the impact and standard error estimates from our study (the same information used to calculate a p -value or a confidence interval); the smallest impact the intervention must achieve in order to be considered effective; the proportion of similar interventions that are effective for a given outcome, based on previous research. We will assess the sensitivity of our estimated probabilities to different definitions of *effective* and *similar*.

Ideally we would estimate this probability for each of the primary outcomes, but some of the primary outcomes may not be measured in comparable studies. For example, the BOND, Ticket to Work, and Accelerated Benefits evaluations are relevant for estimating this probability of a true program effect, but they do not all estimate impacts for a measure comparable to our measure of substantive employment (defined as earnings above SGA). Conversely, employment is a secondary outcome, but because it is measured consistently across relevant studies and still important, it would be a candidate to include in this analysis.

To illustrate how these three pieces of information contribute to our assessment of the probability that the benefit offset is effective, we combine them all into an example figure (Exhibit E.2). In this artificial example, we show (in bold black) an impact of the benefit offset on employment of 2.5 percentage points with a 95 percent confidence interval ranging from 1 to 4. The light blue circles in the figure represent impacts estimated in (hypothetical) past studies of similar interventions. By *similar* we mean other interventions that attempted to increase employment for SSDI recipients. The dashed horizontal line represents the threshold for being deemed effective—an impact of 2 percentage points.

In this artificial example, there appears to be a good chance the benefit offset is truly effective. The point estimate is above the yellow line, the lower bound of the confidence interval is above zero, and past research shows that it is not unusual to find impacts on employment that are greater than 2 percentage points (9 of the 20 previous impact estimates are above 2 percentage points).

By way of contrast, Exhibit E.3 shows an example in which there is less chance that the benefit offset is truly effective at increasing employment rates. In this example, the estimated impact and confidence interval are the same as the first example, but the impacts estimated in (hypothetical) past studies show that it is very unusual for programs to have an impact large enough to be deemed effective (only 2 of the 20 previous impact estimates are above 2 percentage points). In this example, we would need a much more precisely estimated impact to be confident that it is a truly effective program—rather than random noise—that resulted in the point estimate being above 2 percentage points.

Exhibit E.2. Assessing the probability POD is truly effective, Example 1

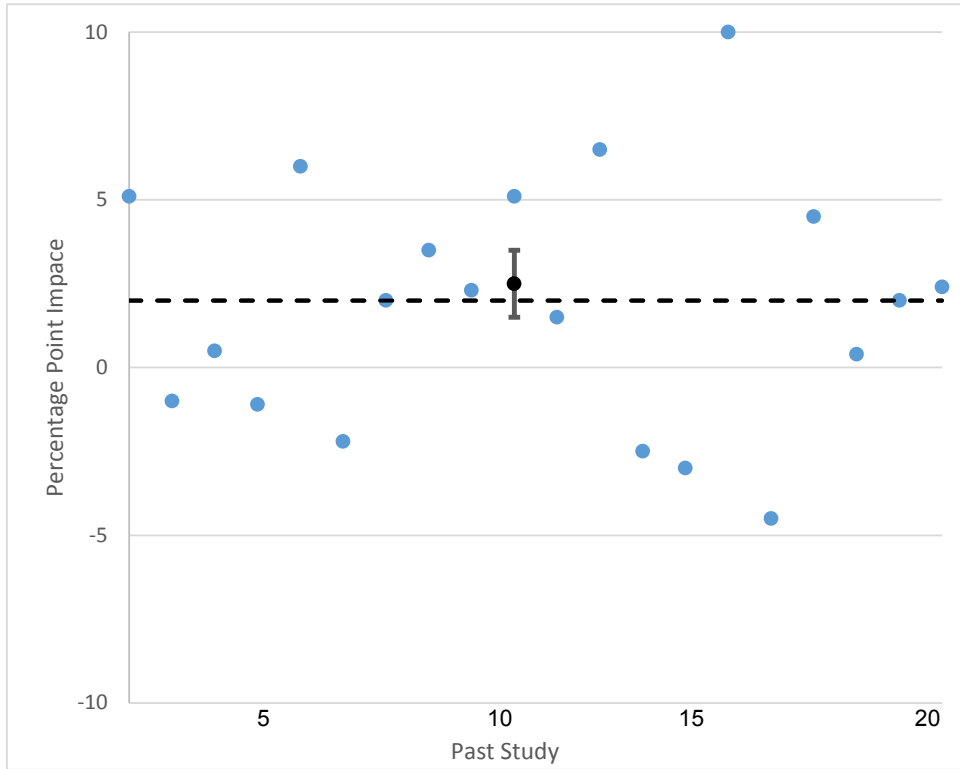
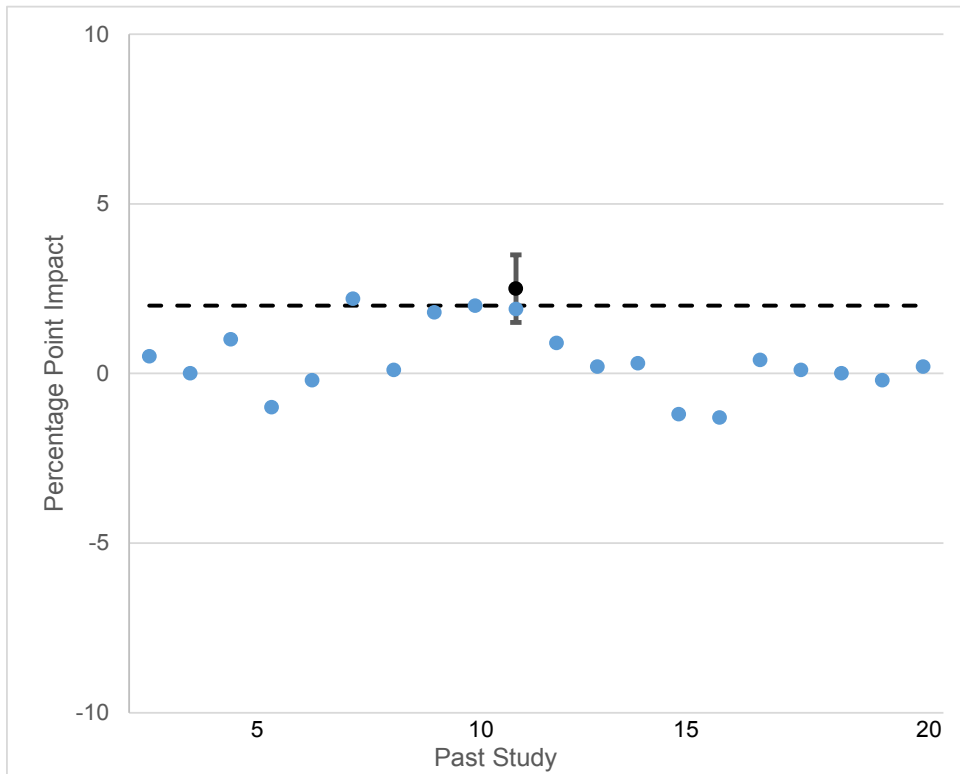


Exhibit E.3. Assessing the probability POD is truly effective, Example 2



We can use the information displayed in Exhibits E.2 and E.3 to calculate the probability that we would like to know: that the benefit offset truly increases employment when the estimated impact is statistically significant. The probability that the benefit offset truly increases employment when the estimated impact is statistically significant is 1 minus the probability of a false discovery. The false discovery rate (FDR) is the fraction of all statistically significant impact *estimates* in which the *true* impact is zero (Benjamini and Hochberg 1995; Storey 2003; Colquhoun 2014). This fraction is stated in Equation (1), where R is the number of rejected null hypotheses and V is the number of falsely rejected null hypotheses.¹ For example, if the null hypothesis is that the true impact of POD is zero, then the null is falsely rejected when (1) the true impact really is zero and (2) the estimated impact is statistically significant. The null is correctly rejected when the null is actually not true (that is, when the true impact is not zero).

$$(1) FDR = E \left[\frac{V}{R} | R > 0 \right]$$

The FDR can also be expressed as in Equation (2),² where the symbol H_0 represent the event that the null hypothesis is true (for example, the true impact of POD on employment is zero), the symbol H_1 represents the event that a specific alternative hypothesis is true (for example, the true impact of POD on employment is 2 percentage points), *reject* means that the null hypothesis is rejected (for example, because the impact estimate is statistically significant), the symbol α is the significance level used in hypothesis testing (for example, 5 percent), and *power* is the statistical power to detect a specific impact.

$$(2) P(H_0 | reject) = \frac{P(H_0) * P(reject | H_0)}{P(reject | H_0) * P(H_0) + P(reject | H_1) * P(H_1)}$$

$$\frac{P(H_0) * \alpha}{\alpha * P(H_0) + power * P(H_1)}$$

We can also calculate the probability that an intervention is truly effective when the estimated impact is statistically significant. Equation (3) provides the formula for this probability.

$$(3) P(H_1 | reject) = \frac{P(H_1) * power}{power * P(H_1) + \alpha * P(H_0)}$$

The quantity $P(H_1)$ can be estimated using data. In our example figures in Chapter VII, $P(H_1)$ is estimated to be the proportion of black circles above the gold line (0.45 for Example 1; 0.10 for Example 2). For these two examples, we assume that *power* is 80 percent and that α

¹ We use the definition of the FDR proposed by Storey (2003) in which the FDR is defined only when $R > 0$.

² Storey (2003) and Colquhoun (2014) present formulas similar to Equations (2) and (3).

is 5 percent. Substituting these values into Equation (3) yields Equation (4) for Example 1 and Equation (5) for Example 2.

$$(4) P(H_1 | reject) = \frac{0.45 * 0.8}{0.8 * 0.45 + 0.05 * 0.55} = 0.93$$

$$(5) P(H_1 | reject) = \frac{0.10 * 0.8}{0.8 * 0.10 + 0.05 * 0.90} = 0.64$$

For Example 1 (Exhibit E.2), the probability that the benefit offset is truly effective given that the impact is statistically significant is 93 percent. For Example 2, that probability is 64 percent. These probabilities illustrate the point made by the American Statistical Association statement on *p*-values—the *p*-value in and of itself does not tell us the probability that an impact is due to chance. The impact, standard error, and *p*-values are the same in these two examples, yet the probability that the impact is real (that is, greater than 2 percentage points as opposed to being the result of random chance) differs substantially between the two examples.

When interpreting findings, we will include a table showing estimates of the probability that each statistically significant impact is due to a true effect of the benefit offset, as opposed to random chance (Exhibit E.4). Because these estimates depend on subjective judgment regarding which past studies are relevant to include when calculating the proportion of past studies in which the intervention was effective, we will show multiple estimates of this probability for each statistically significant impact to assess sensitivity to subjective judgment.

Exhibit E.4. Assessing the probability that significant impacts are truly greater than or equal to the MDI

Outcome	Contrast	MDI	Assumed prevalence of impacts greater than MDI	Probability that the true impact of POD is greater than MDI
Employment rate	T1 versus C	2.2	0.45	0.93
			0.10	0.64

C = control; MDI = minimum detectable impact; T = treatment.