

REPORT

Benefit Eligibility Rules as Code

Reducing the Gap Between
Policy and Service Delivery
for the Safety Net

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Project Credits

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To discuss anything in this guide further, feel free to reach out to us at beeckcenter@georgetown.edu.

Introduction

The United States federal government communicates the eligibility criteria for social safety net benefits through legislation passed by Congress as well as regulations and policies issued by the corresponding administering agencies. Many of the rules governed by these policies are not uniform across programs and can have different definitions for fundamental concepts such as who is included in a household and what constitutes income.^{1,2,3} This system creates barriers to accessing services for individuals who are attempting to access one or more programs to address their needs, and who should not have to understand the intricacies of the rules for each program in order to receive benefits they are eligible to receive.

Additionally, the complexity of the rules create a burden for state and local government agencies and delivery organizations to interpret the legislation, regulations, and policy for the delivery of benefits in their jurisdiction. There is also variation in the rules by states due to federal policy that allows states to set additional parameters for eligibility, such as percentage of income in relation to federal poverty guidelines, as well as waivers that offer federal permission for experimentation by states.

The burdens created by complex rules intersect in digital services, which have increasingly become the primary way for many individuals seeking benefits to find out if they are eligible, apply, and manage their benefits once enrolled. There are much-needed ongoing efforts to use human-centered design for improving single and multi-benefit applications and eligibility screening.^{4,5} However, the inherent complexity remains even as the service delivery improves, since the rules that govern the benefits are complex.

For example, for individuals seeking benefits, there will always be a level of complexity to the questions asked in the forms in order to meet the requirements established by the rules. And for states, local governments, and organizations creating digital services, as they interpret the program rules in order to write code in software used for both eligibility pre-screening and final enrollment determinations. Not only does this duplicate efforts across locales and organizations, it leaves much of the rules interpretation and testing for accuracy up to the technology implementer.

1 U.S. Department of Agriculture - Food and Nutrition Service. (2021). SNAP Eligibility. <https://www.fns.usda.gov/snap/recipient/eligibility>

2 Urban Institute. (n.d.). Child Care Development Fund (CCDF) Policies Database. <https://ccdf.urban.org/resources>

3 Urban Institute. (n.d.). Welfare Rules Database. <https://wrd.urban.org/wrd/WRDWelcome.cfm>

4 Sullivan, K., Soka, S., Selzer, L., & Dorantes, G. (2021). Preparing for Human-Centered Redesign. Beek Center for Social Impact + Innovation and Civilla. <https://beeckcenter.georgetown.edu/report/preparing-for-human-centered-redesign/>

5 Soka, S. (2022). Integrating Social Safety Net Benefits. Beek Center for Social Impact + Innovation. <https://beeckcenter.georgetown.edu/report/integrated-benefits>

In this report, we explore how the U.S. federal government could improve the efficiency and equity of benefit delivery to Americans in need by applying new approaches to eligibility requirements for core safety net programs, including:

1. **Further harmonizing the definitions for core means-tested requirements**, such as income and household, across benefit programs.
2. **Utilizing a “rules as code” approach to improve the digitization of legislation, regulation, and policy documents** by issuing logic flows and computer-consumable code versions of program eligibility criteria, alongside their legal text counterpart, via open source rules code and data feeds.
3. **Incentivizing states, local governments, and delivery organizations to integrate open source rules code and data feeds** into their eligibility screening and enrollment application software.
4. **Creating new policy tools** to assist policymakers and legislators in modeling and measuring impacts of safety net policy changes.

These approaches in turn could:

- **Lessen the “learning cost” and “compliance cost” administrative burdens on people seeking benefits** by using the same definitions for core means-tested requirements and standardizing the format for communicating eligibility requirements.
- **Reduce burdens for public employees** who are charged with administering and delivering benefits.
- **Close the gap between policy and service delivery** by reducing ambiguities in interpretation of policy as it is written into code for digital delivery systems, and allow for feedback loops between policymakers and software developers as they collaborate to develop the code.
- **Reduce duplication of efforts across states, local governments and delivery organizations** to interpret and code eligibility requirements.
- **Enable more cross-benefit eligibility screening and enrollment.**
- **Reduce the overall cost of the administration of safety net programs** for states and local governments.
- **Allow for code-based evaluation and impact assessment of policy changes.**
- **Provide transparency** into the interpretation of rules in digital decision making systems.

This report is intended to spark conversation and collaboration towards advancing common data structures and definitions, paired with new ways of writing and publishing policy. In turn, this effort will reduce the percentage of benefits left on the table by those who are eligible but unenrolled, encourage sharing and transparency to reduce the cost of administering benefits, and facilitate ways to test policy and rule changes for upcoming legislation and scenario planning.

The Means-Tested Safety Net

Before we dive into each of these actions, let's ground ourselves in the means-tested social safety net programs that are the focus of this report. Means-tested benefit programs are defined as those that are only available to individuals or families whose income fall under the limit set by that particular benefit program. It does not include benefits that are available for qualifying individuals regardless of their income level, like unemployment insurance and social security retirement benefits.⁶

CORE MEANS-TESTED BENEFITS PROGRAMS

OVERVIEW ⁷ AND HISTORY ⁸	ENROLLMENT NUMBERS	FEDERAL COST TO ADMINISTER
Supplemental Nutrition Assistance (SNAP) U.S. Department of Agriculture Food and Nutrition Service Agency		
Created in 1964 with the Food Stamp Act, SNAP grants food EBT cards for individuals and families who are at or below the poverty line.	41.5 million in FY 2021. ⁹	\$112.6 billion in FY 2021. ¹⁰
Women, Infants and Children Supplemental Nutrition Assistance (WIC) U.S. Department of Agriculture Food and Nutrition Service Agency		
Founded in 1972, the WIC program provides food, nutrition education, and counseling for pregnant women and women with low incomes whose children are age five or younger.	6.2 million in FY 2021. ¹¹	\$4.9 billion in FY 2021. ¹²
Temporary Assistance for Needy Families (TANF) U.S. Department of Health and Human Services Office of Family Assistance		
TANF is a block grant that was created as part of the 1996 Personal Responsibility and Work Opportunity Act; the program gives cash and noncash (child care, transportation, etc.) assistance for low income families.	2.6 million in 2020. ¹³	\$16.5 billion of each year since 1996. ¹⁴

6 Minton, S. & Giannarelli, L. (2019). Five Things You May Not Know about the US Social Safety Net. Urban Institute. https://www.urban.org/sites/default/files/publication/99674/five_things_you_may_not_know_about_the_us_social_safety_net_1.pdf

7 Smith, C. & Soka, S. (2021). Technology, Data, and Design-Enabled Approaches for a More Responsive, Effective Social Safety Net. Beeck Center for Social Impact + Innovation. <https://beeckcenter.georgetown.edu/wp-content/uploads/2021/02/SSNB-Living-Report-Jan-2021.pdf>

8 University of California Davis. (2018). What are the major federal safety net programs in the U.S.?. Center for Poverty and Inequality Research. <https://poverty.ucdavis.edu/article/war-poverty-and-todays-safety-net-0>

9 U.S. Department of Agriculture - Food and Nutrition Service. (2022). Supplemental Nutrition Assistance Program Participation and Costs. <https://fns-prod.azureedge.net/sites/default/files/resource-files/SNAPsummary-1.pdf>

10 Ibid.

11 USDA Food and Nutrition Service. (2022). WIC Program Participation and Costs. <https://fns-prod.azureedge.net/sites/default/files/resource-files/wisummary-1.pdf>

12 Ibid.

13 Congressional Research Service. (2021). The Temporary Assistance for Needy Families (TANF) Block Grant: Responses to Frequently Asked Questions. <https://sgp.fas.org/crs/misc/RL32760.pdf>

14 Ibid.

OVERVIEW ⁷ AND HISTORY ⁸	ENROLLMENT NUMBERS	FEDERAL COST TO ADMINISTER
Social Security Supplemental Income / Disability Insurance (SSI/SSDI) U.S. Social Security Administration		
Passed in 1972 in order to expand Social Security, SSI/SSDI provides cash assistance for elderly, blind, or disabled people with limited incomes who have made contributions to Social Security.	7.9 million on SSI ¹⁵ and 8.3 million on SSDI in 2020. ¹⁶	\$56.4 billion ¹⁷ for SSI in 2020 and \$145 billion for SSDI in 2019. ¹⁸
Medicaid U.S. Department of Health and Human Services Centers for Medicare and Medicaid Services		
Established as part of the 1965 Social Security Act, this program acts as health insurance for low-income families and individuals as well as a Medicare premium and long term care support for low-income seniors and people with disabilities.	76.3 million in 2021. ¹⁹	\$671.2 billion in 2020. ²⁰
Children's Health Insurance Program (CHIP) U.S. Department of Health and Human Services Centers for Medicare and Medicaid Services		
CHIP was first created in 1997 and strengthened in 2009 with the Children's Health Insurance Program Reauthorization Act. This program administers assistance paying for children's health insurance for low income families who do not qualify for Medicaid.	6.9 million in 2020. ²¹	\$19.8 billion in FY 2020. ²²
Child Care (CCDF) U.S. Department of Health and Human Services Office of Child Care within the Administration for Children and Families		
Initially funded by the Child Care and Development Block Grant Act of 1990, the CCDF was revised and implemented in 1998 with new regulations from the Administration for Children and Families. ²³ The program assists in paying for childcare for families with working parents and children under age 13 and/or under age 18 with special needs. ²⁴	1.3 million according to data available in 2021. ²⁵	\$60 billion FY 2021. ²⁶

15 Ibid.

16 Center on Budget and Policy Priorities. (2020). Policy Basics: Social Security Disability insurance. <https://www.cbpp.org/research/social-security/social-security-disability-insurance>

17 Social Security Administration. (2021). Annual Report of the Supplemental Security Income Program. <https://www.ssa.gov/OACT/ssir/SSI21/ssi2021.pdf>

18 Ibid.

19 Medicaid.gov. (2021). June 2021 Medicaid & CHIP Enrollment Data Highlights. <https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html>

20 Centers for Medicare and Medicaid Services. (2021). NHE Fact Sheet. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NHE-Fact-Sheet>

21 Medicaid.gov. (2021). June 2021 Medicaid & CHIP Enrollment Data Highlights. <https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html>

22 Peter G. Peterson Foundation. (2021). Three Key Things to Know About CHIP. <https://www.pgpf.org/blog/2021/10/three-key-things-to-know-about-chip>

23 Child Care Technical Assistance Network. (n.d.). History and Purposes of the CCDBG and CCDF. <https://childcareta.acf.hhs.gov/ccdf-fundamentals/history-and-purposes-ccdbg-and-ccdf>

24 Giannarelli, L. & Minton, S. (2019). Five Things You May Not Know about the US Social Safety Net. Urban Institute. https://www.urban.org/sites/default/files/publication/99674/five_things_you_may_not_know_about_the_us_social_safety_net_1.pdf

25 Office of Child Care. (2021). OCC Fact Sheet. <https://www.acf.hhs.gov/occ/fact-sheet>

26 Mackey, Rachel. (2021). Policy Brief: Support the Child Care and Development Fund (CCDF). National Association of Counties. https://www.naco.org/sites/default/files/documents/2021%20Policy%20Brief_CCDF.pdf

OVERVIEW ⁷ AND HISTORY ⁸	ENROLLMENT NUMBERS	FEDERAL COST TO ADMINISTER
Earned Income Tax Credit (EITC) U.S. Department of the Treasury Internal Revenue Service		
Created in 1975, the EITC benefits working people who have low to moderate income, especially families.	25 million in 2021. ²⁷	\$60 billion FY 2021. ²⁸
Child Tax Credit (CTC) U.S. Department of the Treasury Internal Revenue Service		
Established in 1997 as part of the Taxpayer Relief Act, the Child Tax Credit program can reduce the federal tax a parent owes by \$1,000 for each qualifying child under the age of 17. ²⁹ This program was expanded in 2021 under the American Rescue Plan to include additional monthly payments for each child in the family for one year.	35.2 million in 2020. ³⁰	\$113 billion in 2020. ³¹

GEOGRAPHIC INEQUITIES IN THE MEANS-TESTED SOCIAL SAFETY NET

As mentioned in the introduction, states are allowed certain leeway to determine additional eligibility parameters for means-tested benefit programs. The specific allowances for states vary according to benefit program, determined by Congressional legislation and regulations set by the program’s federal administering agency (such Centers for Medicare and Medicaid Services within the U.S. Department of Health and Human Services, the U.S. Department of Agriculture’s Food and Nutrition Service, and so on). This distribution of rule-setting power across multiple levels of government is characteristic of a federalist system, in which a national government holds primary authority, though the smaller jurisdictions within states, territories, tribes, counties, and municipalities maintain sovereignty over certain issues.^{32,33}

State discretion in benefit programs can involve financial rules (such as joint federal-state funding arrangements, state funding levels for programs, and state discretion in spending federal funds), rule-making authority (like eligibility and conditions of receipt), and administrative and operational practices (such as implementation, management, and frontline delivery).³⁴ While some states use rule variations to increase the range of eligibility, researchers have found that benefit programs that allow for relatively-greater state discretion in rulemaking—such as cash assistance (TANF)—have higher inequities in benefit provision from state to state.

27 Internal Revenue Service. (2021). Statistics for Tax Returns with the Earned Income Tax Credit (EITC). <https://www.eitc.irs.gov/eitc-central/statistics-for-tax-returns-with-eitc/statistics-for-tax-returns-with-the-earned-income>

28 Ibid.

29 Benefits.gov. (n.d.). Child Tax Credit. <https://www.benefits.gov/benefit/938>

30 Reinicke, C. (2021). 35.2 million families just got the first monthly child tax credit payment. CNBC. <https://www.cnbc.com/2021/07/15/the-first-child-tax-credit-payments-are-out-to-35point2-million-families.html>

31 Urban Institute. (2021). Six Charts about Federal Spending on Children during the Pandemic. <https://www.urban.org/features/six-charts-about-federal-spending-children-during-pandemic>

32 Herd, P. & Moynihan, D. (2018). Administrative Burden: Policymaking by Other Means. Russell Sage Foundation.

33 Legal Information Institute. (n.d.). Federalism. Cornell Law School. <https://www.law.cornell.edu/wex/federalism>

34 Bruch, S., Myeres, M., & Gornick, J. (2018). Consequences of Decentralization: Inequality in Safety Net Provision in the Post-Welfare Reform Era. *Social Service Review*, 92(1). <https://doi.org/10.1086/696132>

This system means a household with a certain number of people and income level in one state would be eligible for a benefit program, while a similar household in a different state would not be eligible for the same program.³⁵ Furthermore, means-tested benefit programs tend to have a greater degree of state discretion than non-means-tested benefit programs.³⁶

In their book *Administrative Burden*, Pamela Herd and Donald Moynihan suggest that, while some states may intentionally decrease benefit availability and access for political purposes, another component of these state-to-state inequities are differences in states' administrative capacity to implement benefit delivery, especially within a short time frame.³⁷ This is where coded eligibility rules made available at the federal level—with state-level adaptations allowable—could reduce the burden of implementation placed upon state agencies and reduce state-to-state inequities in benefit availability. It would also reduce the potential for state interpretations of federal rules that increase burdens on people seeking benefits.

THE COMPLEX USER JOURNEY TO RECEIVING BENEFITS

Usually, people seeking public benefits must navigate difficult, frustrating, and time-consuming steps.^{38,39,40} Previous work done to better understand the interactions and pain points in the benefit applicant process includes a 2016 research collaboration between the U.S. Digital Service (USDS) and the Centers for Medicare and Medicaid Services (CMS) with people seeking benefits, administrators, navigators, and delivery organizations across the United States. One artifact of this research was a diagram (a [journey map](#)⁴¹) that represents a typical experience for a benefit applicant, including documenting significant pain points in eligibility and application processes for knowing where to start, sourcing documents to prove eligibility, and online access.

35 Ibid.

36 Ibid.

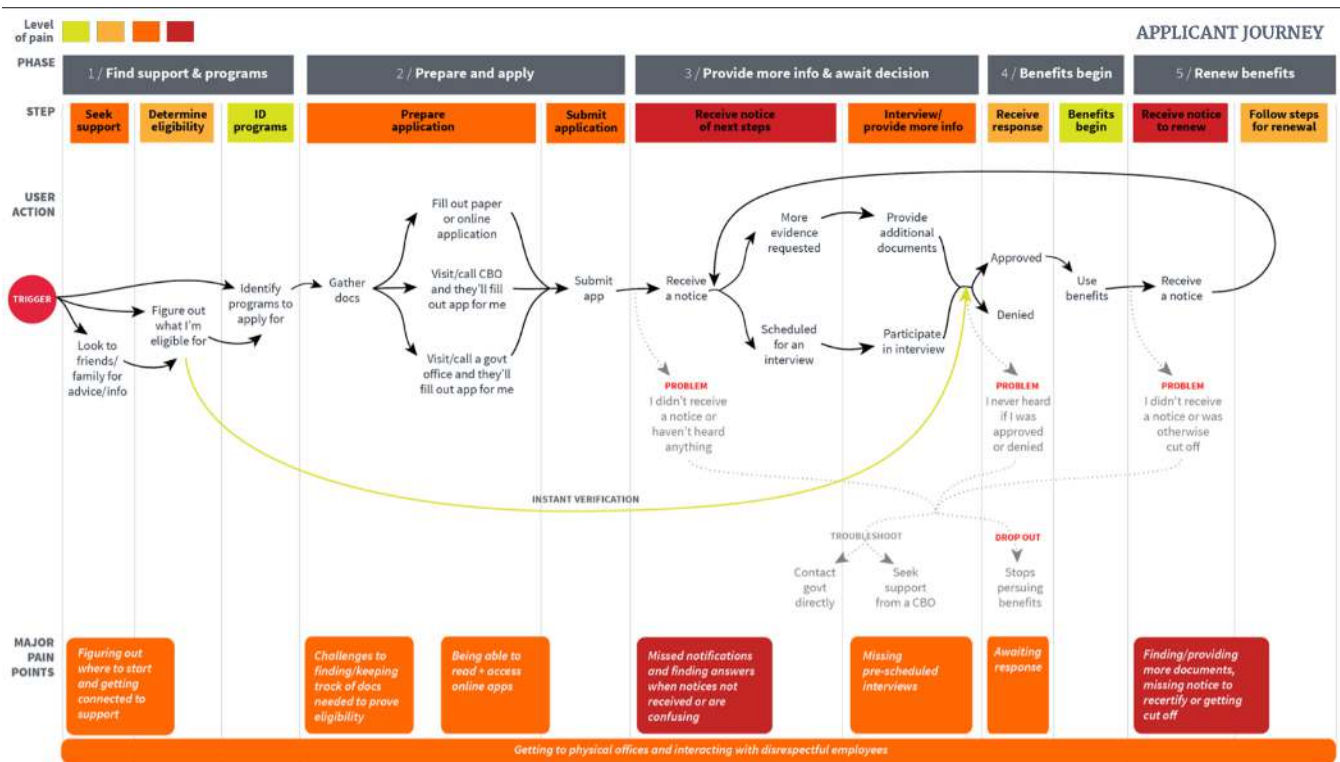
37 Herd, P. & Moynihan, D. (2018). *Administrative Burden: Policymaking by Other Means*. Russell Sage Foundation.

38 Ibid.

39 Lowrey, A. (2021). Time Tax. Atlantic. <https://www.theatlantic.com/politics/archive/2021/07/how-government-learned-waste-your-time-tax/619568/>

40 U.S. Digital Service and the Centers for Medicare and Medicaid Services. (2016). Mapping the Applicant Experience of Benefit Enrollment. <https://usds.github.io/benefits-enrollment-prototype/assets/discovery-findings-mapping-enrollment-Nov2016.pdf>

41 18F. (n.d.) Journey Mapping. 18F Methods. <https://methods.18f.gov/decide/journey-mapping/>



Above: A journey map representing the typical experience of a person seeking public benefits, which suggests an alternate path with the addition of instant verification of benefits eligibility (combining benefit screening and determination steps). Taken from the 2016 presentation, “Mapping the Applicant Experience of Benefit Enrollment,” presenting research by USDS and CMS.

The difficulties that benefit applicants face are an example of administrative burdens, defined by Pamela Herd and Donald Moynihan as “...the costs [in time and other resources] that people encounter when they search for information about public services (learning costs), comply with rules and requirements (compliance costs), and experience the stresses, loss of autonomy, or stigma that come from such encounters (psychological costs).”⁴² These burdens affect the uptake rate for means-tested benefit programs, leaving sizable participation gaps (for instance, 18% for SNAP in 2018 and an estimated 63% for WIC in 2019).^{43,44,45,46,47}

42 Herd, P. & Moynihan, D. (2018). Administrative Burden: Policymaking by Other Means. Russell Sage Foundation.
 43 Stuber, J. & Schlesinger, M. (2006). Sources of Stigma for Means-Tested Government Programs. Social Science & Medicine. 63(4):933-45. <https://pubmed.ncbi.nlm.nih.gov/16542766/>
 44 Holden, L. (2021). SNAP Gap: A State-by-State Glance. Food Research & Action Center. <https://frac.org/blog/the-snap-gap-a-state-by-state-glance>
 45 Holden, L. (2021). USDA-FNS Releases SNAP Participation Rates for Fiscal Years 2016-2018. Food Research & Action Center. <https://frac.org/blog/usda-fns-releases-snap-participation-rates-for-fiscal-year-2016-2018>
 46 Hall, L. & Neuberger, Z. (2021). Eligible Low-Income Children Missing Out on Crucial WIC Benefits During Pandemic. Center on Budget and Policy Priorities. <https://www.cbpp.org/research/food-assistance/eligible-low-income-children-missing-out-on-crucial-wic-benefits-during>
 47 Pelto, D. et al. (2020). Nutrition Benefits Participation Gap: Barriers to Uptake of SNAP and WIC Among Latinx American Immigrant Families. Journal of Community Health, 45(3). <https://pubmed.ncbi.nlm.nih.gov/31630308/>

Several recommendations resulting from the 2016 research conducted by USDS and CMS on the benefit applicant experience involve reducing administrative burdens for applicants, including “tak[ing] on the role of verifying applicant eligibility, reducing burden for applicants and churn in the process of eligibility determination.” The recommendation encourages system development that allows for instant verification of eligibility status and for program staff to manually verify applicant eligibility. The steps this system change could avoid, through data linkages, continued rule modifications, and more efficient and consistent implementations of federal rules, are shown by the alternate path in the journey map.⁴⁸

LEGISLATION FOR HARMONIZATION AND DIGITIZATION OF ELIGIBILITY RULES AND IMPROVED SAFETY NET SERVICE DELIVERY

Prior to the 2016 research conducted by USDS and CMS, legislation helped pave a possible path forward for improving cross-benefit eligibility and enrollment. There is a clear mandate for this work, however it has not yet been done effectively.

The 2010 [Patient Protection and Affordable Care Act](#) (ACA) in Section 1561 calls for improved standards, protocols, and methods for verifying eligibility and simplifying enrollment in federal and state human services programs, including the “ability to expand the enrollment system to integrate new programs, rules, and functionalities, to operate at increased volume, and to apply streamlined verification and eligibility processes to other Federal and State programs, as appropriate.”⁴⁹ The legislation was then followed by recommendations from the U.S. Department of Health & Human Services (HHS), in consultation with the Health Information Technology (HIT) Policy Committee and the HIT Standards Committee, which includes specific calls to action regarding business rules including that “federal agencies and States should express business rules using a consistent, technology-neutral standard format” and “upon identification of a consistent standard, Federal agencies and States should clearly and unambiguously express their business rules (outside of the transactional systems).”⁵⁰

Furthermore, the committees recommended “to allow for the open and collaborative exchange of information and innovation, we recommend the Federal government maintain a repository of business rules needed to administer Affordable Care Act health insurance coverage options (including Medicaid and CHIP), which may include an open source forum for documenting and displaying eligibility, entitlement and enrollment business rules to developers who build systems and the public in standards-based and human-readable formats.

48 U.S. Digital Service and the Centers for Medicare and Medicaid Services. (2016). Mapping the Applicant Experience of Benefit Enrollment. <https://usds.github.io/benefits-enrollment-prototype/assets/discovery-findings-mapping-enrollment-Nov2016.pdf>

49 Patient Protection and Affordable Care Act, 42 U.S.C. § 18001 (2010). <https://www.congress.gov/111/plaws/publ148/PLAW-111publ148.pdf>

50 National Coordinator for Health Information Technology (2011). Patient Protection and Affordable Care Act Section 1561 Recommendations. <https://www.healthit.gov/sites/default/files/rules-regulation/aca-1561-recommendations-final2.pdf>

To allow for seamless integration of all health and human services programs, business rules for other health and human services programs such as SNAP and TANF should be added to the repository over time.”⁵¹ This pushed many states to take on a business rules engine approach to building out their eligibility and enrollment systems, however there is not a single source truth for rules or a shared standard from the federal government.

The ACA also introduced a new way to calculate income for eligibility for health insurance supports, including Medicaid and CHIP, using Modified Adjusted Gross Income (MAGI).⁵² MAGI seeks to simplify how income and household size are calculated, which are then compared against the Federal Poverty Level for determining eligibility. However, MAGI is still very complex with specific rules about certain types of income, whose income is counted in a household, and has exempt populations.

Most recently, the December 2021 [Executive Order](#) on Transforming Federal Customer Experience and Service Delivery to Rebuild Trust in Government⁵³ presents a new opportunity to revisit and revise elements of delivering the social safety net to ensure more equitable and efficient delivery for Americans as their needs require throughout stages of life. The Executive Order states that the “government must also work to deliver services more equitably and effectively, especially for those who have been historically underserved,” and “work with the Congress; the private sector and nonprofit organizations; State, local, Tribal, and territorial governments; and other partners to design experiences with the Federal Government that effectively reduce administrative burdens, simplify both public-facing and internal processes to improve efficiency, and empower the Federal workforce to solve problems.”

The Executive Order points to technology as part of a way to “modernize Government and implement services that are simple to use, accessible, equitable, protective, transparent, and responsive for all people of the United States,” and to identify and resolve the root causes of customer experience challenges “regardless of whether the source of such challenges is statutory, regulatory, budgetary, technological, or process-based.” Under specific initiatives highlighted in the Executive Order, such as directing the Secretary of Health and Human Services and Commissioner of Social Security to support cross benefit eligibility and enrollment and streamlining state enrollment processes, there are many opportunities to address the burdens created by safety net eligibility rules.

51 Office of the National Coordinator for Health Information Technology. (2011). Patient Protection and Affordable Care Act Section 1561 Recommendations. <https://www.healthit.gov/sites/default/files/rules-regulation/aca-1561-recommendations-final2.pdf>

52 Gross, B., Machledt, D., & Turner, W. (2018). The Advocate’s Guide to MAGI. National Health Law Program. <https://healthlaw.org/resource/advocates-guide-to-magi/#.UrDvlfRDuSo>

53 The White House (2021). Exec. Order No. 14058. 86 FR 71357 2021-27380. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/13/executive-order-on-transforming-federal-customer-experience-and-service-delivery-to-rebuild-trust-in-government/>

Call to Action 1: Harmonize the Rules

ACTION

There is a clear need to further harmonize the definitions of core means-tested requirements, such as income and household, across benefit programs to reduce burdens on those navigating the social safety net. The historic silos that stand between federal agencies and programs have created a tangled web of eligibility rules that make delivering on interoperability between programs—like what was called for in the ACA—challenging.

[Alluma](#) defines an interoperable system as one that is “intentionally designed from the outset... that will streamline enrollment and eligibility processes” where “interoperability will be built into the digital tools, written into policies, and enacted via procedures that agencies use.” They imagine an interoperable system for public benefits where “one application will determine your eligibility for many programs and initiate enrollment when appropriate.”⁵⁴

While it is technically possible to apply a rules as code approach to the rules as they currently exist, further harmonization across the programs will improve the overall experience of seeking cross-benefit assistance, as well as make the technology easier to implement. Under the [Executive Order](#) on Transforming Federal Customer Experience,⁵⁵ there is a government-wide call to action to improve experience for Americans who are navigating across programs in moments of need, and to provide an integrated experience, as well as coordinate with states to improve efficiency. These efforts to improve the service delivery should also be underpinned by harmonized rules. While some efforts to reduce burdens on people seeking benefits demand more capacity on the part of administrators, thereby creating bureaucratic resistance, harmonization has the potential to be a win-win, making the task simpler for both state agencies and people seeking benefits.

It will be important to consider the consequences of harmonization that have the potential to make people ineligible for programs they were previously eligible for. For example, it may be necessary to build in a “safe harbor” mechanism that continues eligibility for those already receiving the benefit, or use a “superset” methodology to expand eligibility under the harmonized rules.⁵⁶

This guide does not go into the details of comparison of the rules across programs, but we hope that it inspires conversation and collaboration for the needed policy evolution. The [Center for Budget and Policy Priorities](#) and [Alluma](#) (under its former name, Social Interest Solutions) has produced a comprehensive report on [cross-benefit linkages](#)⁵⁷ which is an excellent starting point.

54 Alluma. (2021). The Unfinished Business of the ACA. <https://www.alluma.org/unfinished-business-aca>

55 The White House (2021). Exec. Order No. 14058. 86 FR 71357 2021-27380. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/13/executive-order-on-transforming-federal-customer-experience-and-service-delivery-to-rebuild-trust-in-government/>

56 Guarino, D. & Kennan, A. (2021). Personal communication.

57 Ambegaokar, S., Neuberger, Z., & Rosenbaum, D. (2017). Opportunities to Streamline Enrollment Across Public Benefit Programs. Social Interest Solutions and Center on Budget and Policy Priorities. <https://www.cbpp.org/research/poverty-and-inequality/opportunities-to-streamline-enrollment-across-public-benefit>

IMPACT

- Lessen the “learning cost” and “compliance cost” administrative burdens on people seeking benefits by using the same definitions for core means-tested requirements and standardizing the format for communicating eligibility requirements.
- Improve ability for cross-benefit linkages, making it easier for people seeking benefits to enroll in all of the programs they are eligible for.
- Allow safety net technology to reflect streamlined benefits policy, rather than obscuring complexity.

Call to Action 2: Eligibility Rules as Code

ACTION

The U.S. federal government can utilize a “rules as code” approach to improve the digitization of legislation, regulation and policy documents pertaining to public benefits eligibility. The OECD Observatory for Public Sector Innovation (OPSI) defines rules as code as “an official version of rules (e.g., laws and regulations) in a machine-consumable form, which allows rules to be understood and actioned by computer systems in a consistent way.”⁵⁸

Currently, in order to implement benefits eligibility and enrollment systems, state, county, territorial, tribal, and municipal governments, service providers, and technology implementers analyze federal legislative documents and interpret the requirements to write the rules into their technology. Not only is this inefficient and duplicative across numerous organizations, it creates a gap in transparency between how decisions were made, and in the end, determinations about what kind of support an individual or family receives. These efforts are compounded when there are changes or updates to rules.

“Around the world, public sector organisations are increasingly aware that existing ways of operating are no longer sufficient to manage the complexities of the modern world. Facing wicked, multi-faceted challenges which proliferate and morph with increasing speed (not to mention sudden shocks or crises, such as the coronavirus (COVID-19) pandemic), there is growing acknowledgment that governments’ current systems, infrastructures and ways of working are no longer delivering the level or standard of outcomes rightly expected by citizens and businesses (Hynes et al., 2020: 16). Typically, and understandably, most public attention is directed to the substance and quality of the rules created by the state. Less attention, however, is given to the administrative and bureaucratic dimensions of how rules are created, governed and implemented.”

- OECD OPSI, “Cracking the code: Rulemaking for humans and machines”

The U.S. federal government has made great strides in the path towards digitizing legislation, by providing HTML and “born digital” PDF versions through sites such as [Congress.gov](https://www.congress.gov)⁵⁹ and federal agency websites without any restrictions.⁶⁰ To continue on a path towards maturity of digital legislation and lawmaking, the government must develop new shared standards, code repositories, data feeds, and potentially tools such as APIs and rules engines.

58 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 11-12. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

59 U.S. Congress. (n.d.). <https://www.congress.gov/>

60 Wong, M.W. (2020). Rules as Code - Seven Levels of Digitisation. Research Collection School of Law, Singapore Management University. https://ink.library.smu.edu.sg/sol_research/3093

RULES AS CODE INTERNATIONALLY

Countries outside the United States, including France, Denmark, and New Zealand, have taken steps to integrate a rules as code approach into their government operations. Look for these boxes throughout the report to highlight examples from those countries that utilize rules as code to determine eligibility for social assistance programs, among other uses.

Principles for Digital Legislation (Denmark): Guidance for Rulemaking

Anticipating the benefits of rules as code on the administration of social services, the [Danish Agency for Digitalisation](#) established a secretariat (department) in 2018 that guides policymakers in drafting legislation that is optimized to be digitized (translated into code) in the future. Drafted legislation is assessed on its adherence to these seven principles:

1. Simple and clear rules
2. Digital communication
3. Possibility of automated case processing
4. Consistency across authorities: uniform concepts and reuse of data
5. Safe and secure data handling
6. Use of public infrastructure
7. Prevention of fraud and error

In addition to overseeing these assessments, this Secretariat responds to the explanatory notes in specific legislative proposals, which are required to include an impact assessment of the implementation of the proposed legislation. These principles are gaining international interest; the nation of Austria embarked on a similar project to explore how to remove barriers to the digitalization of rules.^{61,62}

U.S. APPROACHES ON ELIGIBILITY SCREENING

As the U.S. Federal Government does not provide centralized rules as code, there are several projects and products that have interpreted policy documents to create their own rule sets for eligibility screening for programs. These tools demonstrate a variety of approaches and philosophies to benefits eligibility, with tactics that can be scaled to provide centralized eligibility rules. Additionally, 43 states have eligibility screening tools and/or benefit calculators.⁶³ More research is needed on enrollment systems in order to understand the full landscape for rules as code.

61 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 62. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

62 Agency for Digitalisation. (n.d.). Digital-Ready Legislation. Danish Ministry of Finance. <https://en.digst.dk/policy-and-strategy/digital-ready-legislation/>

63 Center on Budget and Policy Priorities. (2021). SNAP Online: A Review of State Government SNAP Websites. <https://www.cbpp.org/research/food-assistance/snap-online-a-review-of-state-government-snap-websites>

mRelief

Single Benefit Modular Code Nonprofit

Organization Description & Mission

mRelief is a nonprofit software product company which helps people in all 53 states and territories participating in SNAP find out if they are eligible and apply for SNAP. mRelief seeks to “restore dignity by transforming access to social services.” They have helped over 2.7 million individuals, and have unlocked over \$1 billion in SNAP benefits.⁶⁴

Approach to Eligibility

mRelief offers web-based and text messaging tools for eligibility screening for SNAP. Their tools emphasize ease-of-use through limiting the number of questions and only asking multiple choice or yes/no questions. They have tested this approach with people seeking benefits and against policy and found that, for example, people are more successful in selecting an income range rather than entering an exact amount into a field. After determining if someone potentially qualifies, mRelief directs them to apply, either on their own through a simplified mRelief-developed SNAP application, directly through a state or government agency portal, or with assistance over the phone through a nearby community-based organization. mRelief indexes towards being more inclusive on who may be eligible, so as to generate as few false negatives as possible. Their tools do not provide estimated benefit amounts due to the complexity it would add to the screening questions in order to have an accurate estimate.⁶⁵

Rules Structure & Technology

mRelief’s data schema is structured around three factors of eligibility: 1) gross income limit for household size; 2) state asset limits; and 3) special eligibility categories (e.g., students, persons with disabilities, the elderly, non-citizen immigrants), which their team has applied to all 53 states and territories. They build their technology using Ruby and React with hard-coded rules that live in a single code file.⁶⁶

How They Write Rules

mRelief policy team members scour federal and state websites to track policy updates and changes in policy manuals and worker action guides.⁶⁷ They regularly use resources such as the U.S. Department of Agriculture’s Food and Nutrition Service Agency’s website for the 44 states with Broad-Based Categorical Eligibility.⁶⁸ Their team also subscribes to policy newsletters and advocacy lists, and goes to where people seeking benefits are talking about their experiences such as the food stamps board on Reddit.⁶⁹ The policy team informs their technology team of rule updates, which are then implemented as code in the rules file and tested for accuracy.

64 mRelief. (n.d.). Wireless. <https://mrelief.com/wireless>

65 Hacıoglu, D., Karter, C., Kennan, A., & Soka, S. (2021). Personal communication.

66 Ibid.

67 Ibid.

68 U.S. Department of Agriculture - Food and Nutrition Service. (2020). Broad-Based Categorical Eligibility (BBCE). <https://www.fns.usda.gov/snap/broad-based-categorical-eligibility>

69 Food Stamps - SNAP. (n.d.). Reddit. <https://www.reddit.com/r/foodstamps/>

18F: Eligibility APIs Initiative

Single Benefit Modular Code Federal Government

Organization Description & Mission

18F is an internal technology and design consultancy as part of the Technology Transformation Service (TTS) in the General Services Administration (GSA) in the U.S. Federal Government. Their teams work with federal agencies to build and buy technology, and can also work with states and local agencies on initiatives receiving federal funding. They seek to build digital services that are trustworthy, designed with the people who use them, deliver good value, and are shipped efficiently and when possible, in the open.⁷⁰

Approach to Eligibility

Starting in 2017 through 2020, a team at 18F received multiple rounds of funding through **10x**,⁷¹ the GSA's technology innovation fund, to explore and prototype how the federal government could communicate benefit eligibility rules as computer code for integration into state systems. Under their **Eligibility APIs Initiative**,⁷² the team built a **prototype API and calculator** for the federal rules for SNAP.⁷³ TTS is a potential long term home for a central shared service for eligibility rules across all safety net programs.

Rules Structure & Technology

The prototype model incorporates core federal rules and can include options for each state or territory through Broad-Based Categorical Eligibility. The API backend was originally written in Python, but was further developed as a JavaScript software library to allow the prototype to be deployed entirely client-side, rather than requiring a server. All of the code is open source and available for any federal or state agency or other organization to replicate or redeploy.⁷⁴ The Virginia Poverty Law Center deployed the code to their own website as part of a **Virginia-specific SNAP calculator**;⁷⁵ civic tech volunteers later adapted the code from 18F to create **SNAPScreeener.com**,⁷⁶ which extends the data model to all U.S. states and territories.

How They Write Rules

The technologists at 18F led the prototype rules data format and code, which was then validated with the U.S. Department of Agriculture's Food and Nutrition Service Agency which oversees SNAP,⁷⁷ and with SNAP policy experts at Virginia Poverty Law Center.

70 18F. (n.d.). General Services Administration Technology Transformation Services. <https://18f.gsa.gov/>

71 10x. (n.d.). General Services Administration Technology Transformation Services. <https://10x.gsa.gov/>

72 18F/eligibility-rules-service. (2020). Eligibility APIs Initiative. Github repository. <https://github.com/18F/eligibility-rules-service/>

73 18F/eligibility-rules-service. (2020). Reuse or Extend the SNAP Benefit Calculator. Github repository. <https://github.com/18F/eligibility-rules-service/blob/master/phase-four/reusable-snap-api.md>

74 18F/eligibility-rules-service. (2020). Reuse or Extend the SNAP Benefit Calculator. Github repository. <https://github.com/18F/eligibility-rules-service/blob/master/phase-four/reusable-snap-api.md>

75 Virginia Poverty Law Center. (n.d.). Expanded Benefits May Mean Your Family Is Newly Eligible for Food Help. <https://vpic.org/snap-calculator/>

76 Jump Credit LLC. (2021). SNAP Eligibility Calculator. <https://www.snapscreener.com/>

77 18F/eligibility-rules-service. (2020). Weekly Recaps. Github wiki. <https://github.com/18F/eligibility-rules-service/wiki/Weekly-recaps#phase-4>

NYC Mayor's Office for Economic Opportunity: ACCESS NYC & Benefits Screening API

Multi-Benefit Rules Engine Local Government

Organization Description & Mission

[New York City Mayor's Office for Economic Opportunity](#)⁷⁸ (NYC Opportunity) uses evidence and innovation to reduce poverty and increase equity. The multidisciplinary team funds and scales new approaches, uses methodologies such as service design, digital product development and data integration to improve access to social services, and provides research, including the poverty measure for the city.⁷⁹

Approach to Eligibility

NYC Opportunity offers a suite of digital products, datasets and APIs that comprise the [NYC Benefits Platform](#),⁸⁰ which supports organizations that make it easier for residents to discover and be aware of multiple benefits they may be eligible for, and supports accelerating the creation of new technology tools for benefits discovery and navigation. The platform includes [ACCESS NYC](#),⁸¹ NYC's public benefits information site and eligibility screener. The website serves as a one-stop-shop where residents can learn about over 80 city, state, and federal social safety net benefits and programs (including how to apply and what documents are required), check their eligibility for more than 40 benefits and programs, and find help nearby, all in eleven languages. Originally launched in 2006, NYC Opportunity led a comprehensive re-design of ACCESS NYC with residents, benefits navigators and government staff in 2016-2017 to launch the mobile-first, accessible site including the 10-step eligibility screener. The screener is designed to reduce barriers to access by collecting a minimal amount of information in order to calculate potential program eligibility and not requiring an account. Once someone has screened, they are offered plain language program guides about each benefit and the ability to text or email the results. Since the onset of the COVID-19 pandemic, site traffic has increased to hundreds of thousands per month with a total of more than 6.4 million browsing sessions and 326,000 eligibility screenings completed.⁸²

Rules Structure & Technology

ACCESS NYC's content and code are open source.⁸³ The core site is built using WordPress and hosted through WP Engine. The site utilizes the [ACCESS NYC Patterns](#)⁸⁴ design system, which borrows elements from other open source design systems including the [U.S. Web Design System](#).⁸⁵

78 NYC Mayor's Office for Economic Opportunity. (n.d.). NYC Opportunity. <https://www1.nyc.gov/site/opportunity/index.page>

79 NYC Mayor's Office for Economic Opportunity. (n.d.). Reducing Poverty and Advancing Equity: A Retrospective. <https://www1.nyc.gov/site/opportunity/reports/milestones/milestone-overview.page>

80 NYC Mayor's Office for Economic Opportunity. (n.d.). NYC Benefits Platform: Dataset and Screening API. <https://www1.nyc.gov/site/opportunity/portfolio/nyc-screening-api.page>

81 Access NYC. (n.d.). ACCESS NYC. NYC Mayor's Office for Economic Opportunity. <https://access.nyc.gov/>

82 Hia, S. & Kennan, A. (2021). Personal communication.

83 CityOfNewYork/ACCESS-NYC. (2021). ACCESS NYC. Github repository. <https://github.com/CityOfNewYork/ACCESS-NYC>

84 ACCESS NYC. (n.d.). Patterns. NYC Mayor's Office for Economic Opportunity. <https://accesspatterns.cityofnewyork.us/>

85 U.S. Web Design System. (n.d.). Design System for the Federal Government. General Services Administration. <https://designsystem.digital.gov/>

ACCESS NYC pulls its program guide content from the [Benefits and Programs API](#)⁸⁶ which is hosted for public use on the [NYC Open Data portal](#).⁸⁷ This allows content to be updated without code-based changes.

The eligibility screener is built as a single-page javascript application that utilizes an API to call a [Drools](#)-based rules engine. By keeping the rules engine standalone from the screener, it allows for any front end to be utilized against the rules parameters. The NYC Opportunity team is currently evaluating a possible replatform of the rules engine to make it easier to maintain with less specialized skills, while providing a continued level of open access to the rules.⁸⁸

The [NYC Benefits Screening API](#)⁸⁹ provides open developer access to the rules engine and machine-readable calculations and criteria for the 40+ programs that the ACCESS NYC screening questionnaire screens for. NYC Opportunity also publishes a [comprehensive guide](#) to the information utilized to write the rules, a chart to track eligibility categories by program, and a guide to the screener questions.⁹⁰ While there is robust technology and documentation to support utilizing the rules in other solutions and use cases, the policy and incentives for other agencies and organizations to adopt the solution have not yet followed.⁹¹

How They Write Rules

When NYC Opportunity and their contractor Blue State Digital replatformed the ACCESS NYC rules onto Drools in 2016-2017, they established a common syntax for writing the rules to serve the 10-step screening question parameters, and which has now served as the basis for making continual updates and adding more programs. The NYC Opportunity team tracks recurring changes, policy updates, and poverty threshold changes with city, state, and federal agency liaisons. The agency liaisons also participated in design sessions and quality assurance testing of the new screener and rules engine before launch. When adding a new program, the NYC Opportunity business analyst and product manager work together to evaluate the eligibility criteria against the ten questions asked in the screener to interpret the explicit thresholds and requirements into conditional logic, which can then be implemented by the software developer as rules statements in the rules engine. The rules are tested using an automated testing tool called Ghost Inspector, which allows the team to run scenarios against the rules to ensure they pass or fail as expected.⁹²

86 NYC OpenData. (2022). NYC Benefits Platform: Benefits and Programs Dataset. <https://data.cityofnewyork.us/Social-Services/NYC-Benefits-Platform-Benefits-and-Programs-Datase/kvhd-5fmu>

87 NYC OpenData. (2022). <https://opendata.cityofnewyork.us/>

88 Hia, S., Kennan, A., Soka, S. & Sui, H. (2021). Personal communication.

89 NYC Opportunity. (n.d.). NYC Benefits Platform Screening API. NYC Mayor's Office for Economic Opportunity. <https://screeningapidocs.cityofnewyork.us/>

90 NYC Opportunity. (n.d.). Eligibility Guidelines. NYC Mayor's Office for Economic Opportunity. <https://screeningapidocs.cityofnewyork.us/eligibility-guidelines>

91 Hia, S., Kennan, A., Soka, S. & Sui, H. (2021). Personal communication.

92 Ibid.

Benefits Data Trust: Benefits Launch & Benefits Launch Express

Multi-Benefit Rules Engine Nonprofit

Organization Description & Mission

[Benefits Data Trust](#)⁹³ (BDT) is a nonprofit that works nationally to connect people with public benefits. They use a unique approach that blends direct assistance, policy and practice solutions, data, and technology to provide efficient and dignified access to assistance. Since 2005, they have submitted more than 1 million applications (including over 89,000 in 2021 alone) and secured over \$7.5 billion in benefits for eligible households. BDT currently provides enrollment assistance in seven states.⁹⁴

Approach to Eligibility

To reduce the burden on people applying for multiple benefits at different agencies, BDT offers phone-based application assistance for up to 11 benefit programs. BDT's trained contact center staff utilize a single digital service, Benefits Launch, to conduct an in-depth eligibility and benefit value estimate, complete questions, collect documents, and submit applications on behalf of callers in the formats required by the administering agencies. The average time to complete the screening and resulting applications is approximately 40 minutes. BDT's approach to eligibility questions is informed by thousands of interactions by its contact center with applicants, resulting in ongoing improvements to clarity, efficiency, and conversational connection.

In Philadelphia, BDT also offers [Benefits Launch Express](#),⁹⁵ a high-level eligibility screening and assistance finder for 29 programs that is estimated to take up to 10 minutes and is optimized for self-service or a short touch point that benefits navigators may have with someone seeking assistance. After the screening, Benefits Launch Express directs people to apply via the government agency or with assistance from BDT's contact center or community organizations. The BDT team has worked to ensure questions can be answered quickly, such as by asking whether something applies to anyone in their household, rather than asking for details about each person. BDT seeks to hone the number of programs someone is potentially eligible for and which ones they apply for. All individuals are notified that eligibility is ultimately determined by the administering agencies.⁹⁶

Rules Structure & Technology

BDT's Benefits Launch is built around a rules engine that guides dynamic functions such as eligibility, benefit values, questions to be answered, and required documents. Following the initial development of Benefits Launch, BDT custom built an independent rules engine using Ruby and integrated it with Benefits Launch Express using an Application Programming Interface (API). The API is being used for new use cases, such as integration with a human services referral platform to increase the number of benefit related referrals.

93 Benefits Data Trust. (n.d.). Transforming Benefits Access/Who We Are. <https://bdtrust.org/who-we-are/>

94 Kennan, A., Singer, D., & Soka, S. (2022). Personal communication.

95 Benefits Data Trust. (n.d.). Benefits Launch Express. <https://cwf.benefitslaunch.org/>

96 Kennan, A., Singer, D., & Soka, S. (2021). Personal communication.

How They Write Rules

In order to write the rules, the BDT policy subject matter experts review the federal, state, and local regulations and application forms, and where possible seek confirmation from administering agencies. As there is not a coded or data formatted set of rules provided by any level of government, they work to “reverse engineer” the regulations and applications to infer the eligibility rules. The Benefits Process team then writes linear statements in a spreadsheet that is handed off to a software developer to develop into code in the rules engine. With the rules all in one place, the Benefits Process and Quality Assurance teams can review and test the rules directly through the rules engine to ensure they meet standards.

Alluma: One-x-Connection

Multi-Benefit Rules Engine Nonprofit

Organization Description & Mission

Alluma⁹⁷ is a nonprofit organization dedicated to connecting people to help. They are reimagining the way technology is used to enable people to have agency to connect to opportunity. For over 20 years, Alluma has been providing digital solutions and consulting services that assist individuals, nonprofit organizations, and various state and county agencies with eligibility determination and enrollment into various social benefit programs, and connecting people to local community resources. Through their human-centered, modular solutions, they support cross-benefit eligibility screening and enrollment in 45 counties and two states. Alluma has screened over 10 million individuals for eligibility and submitted more than 67 million program applications.⁹⁸ In 2020, Alluma merged with One Degree to expand their ability to connect people to community-based services in addition to public benefits.⁹⁹

Approach to Eligibility

Alluma’s **One-x-Connection** (OxC)¹⁰⁰ product suite simplifies Medicaid and SNAP eligibility and enrollment as much as possible for applicants and their assisters. OxC provides a quick screener for checking eligibility in a few minutes, a more robust multi-benefit eligibility screener backed by a business rules engine, and multi-benefit enrollment including document submission and management. The screener is anonymous and does not pass information into the application forms.

97 Alluma. (n.d.). <https://www.alluma.org/>

98 Alluma. (n.d.). Solutions. <https://www.alluma.org/what-we-do/solutions>

99 Phillips, R. & Faustino, R. (2020). What If the Social Safety Net System Actually Worked? Alluma. <https://www.alluma.org/alluma-one-degree-social-safety-net>

100 Alluma. (n.d.). What Is One-x-Connection? <https://www.alluma.org/oxc>

To ensure OxC products would truly simplify the application and enrollment process for users, the Alluma team performed a variety of human-centered design-informed practices throughout OxC's design and development, including: conducting user interviews and testing throughout to guide iteration; comparing program applications to identify common data points collected across programs, thereby reducing the number of questions OxC products ask users; and simplifying complicated application terminology into language that testers understood, likely increasing the accuracy of their eligibility results. To further encourage users to pursue programs, and for those who may have borderline eligibility, the screener indexes towards "may be eligible" and directs them to the application.¹⁰¹

Rules Structure & Technology

The OxC front end uses react code that reads JSON configuration files, which can be customized to any organization. The rules are stored independently via a rules engine built in Red Hat Jboss, which integrates with the front end via APIs.

How They Write Rules

When the Alluma team set out to create a rules engine, the policy team started the process by determining which data points the Medicaid and SNAP programs must collect from applicants to determine eligibility. This was done through analyzing the programs' applications, as well as delving into the Code of Federal Regulations (CFR) to determine the policies underpinning the questions found in the applications. From this research the policy team crafted a matrix of data points that must be collected to determine both Medicaid and SNAP eligibility at the same time. The policy and technology teams then worked together to translate these data points into rules, ultimately producing flow charts that explained in plain English a set of rules using "if/then," "this/and," and "or/but" statements. These assets were then handed off to the developer to code into the rules engine. The policy and tech leads then worked together to test the rules based on family situations to see if they generate an expected result, and then are able to continuously iterate on the rules. When there are changes or updates to the rules, such as the annual update to the federal poverty level, the policy and tech teams have a set business process to evaluate, agree to, implement, and test to ensure accuracy and impact on the system as a whole.¹⁰²

While these eligibility tools utilize different approaches, they face some common challenges. The teams expressed the challenge of interpreting the policies and updates across a multitude of benefits, and for those that serve more than one state, across the state-specific nuances and exceptions. All of the teams currently rely on their technical staff to implement the rules; however, they are seeking to make their rules more accessible for policy and business colleagues to use and update. When it comes to sharing the rules beyond their product, many of these initiatives question whether they should be the single source of truth on a set of coded program rules, which is subject to their interpretation, rather than an official set of coded rules from the corresponding federal agency.

¹⁰¹ Jackson, R., Kennan, A. Pañares, R., Shah, H., & Soka, S. (2021). Personal communication.

¹⁰² Ibid.

A FEDERAL SINGLE SOURCE OF TRUTH

Imagine a rules as code approach adopted by the U.S. federal government:

1. Legislators, administrators, and software developers work together to write official U.S. federal government computer-consumable code versions of program eligibility requirements including state-specific rules alongside the legal, or human-readable, counterpart.
2. To improve the ability for non-technical stakeholders to better understand the code, the U.S. federal government issues logic flows in plain language to accompany the code.
3. Any stakeholder can review the legislation or regulation, plain language logic, and code side-by-side and know that all are official and ready for implementation.
4. There is a continuous cycle to write, revise, and test the rules to ensure accuracy.
5. States, territories, tribes, counties, municipalities, and service providers implement accurate, efficient rules and keep them up-to-date in their digital eligibility and enrollment systems.

The Eligibility APIs Initiative at 18F is an excellent start of prototyping what a full-scale, rules-as-code service could look like. With input from the eligibility initiatives above, future implementation could include:

- **Code libraries** with open source versions of the rules for the core federally-funded safety net—including documentation of state-specific rules—in a standardized data format. States, territories, tribes, counties, and municipalities could add their own programs in the shared format.
- **A business rules engine (BRE)** to centrally store and manage the rules and provide the integration point for APIs.
- **Application programming interfaces (APIs)** to allow for direct integration of the rules, including a managed flow for updates and testing. By creating rules and feeds across the swath of benefits, it would become possible to “call” the rules into any front end interface to screen for eligibility for multiple benefits in more touchpoints and deliver on no wrong door approach to ask for help.
- **Batch processes** to screen people who are already in government databases for additional benefits by using batch processes to run the eligibility rules against the data in a privacy-preserving way utilizing the rules as code available over APIs.
- **Standardized data collection** for measurement and evaluation of reducing disparities in access to and utilization of services by marginalized populations and communities.
- With these new tools in place, it will also **inspire creative applications and innovation in service delivery** that we have yet to discover.

IMPACT

- Lessen the “learning cost” and “compliance cost” administrative burdens on people seeking benefits by using the same definitions for core means-tested requirements and standardizing the format for communicating eligibility requirements.
- Reduce burdens for public employees who are charged with administering and delivering benefits.
- Close the gap between policy and service delivery by reducing ambiguities in interpretation of policy as it is written into code for digital delivery systems, and allow for feedback loops between policymakers and software developers as they collaborate to develop the code.
- Reduce duplication of efforts across levels of government and delivery organizations to interpret and code eligibility requirements.
- Enable more cross-benefit eligibility screening and enrollment.
- Reduce the overall cost of the administration of safety net programs for states and local governments.
- Provide transparency into the interpretation of rules in digital decision making systems.

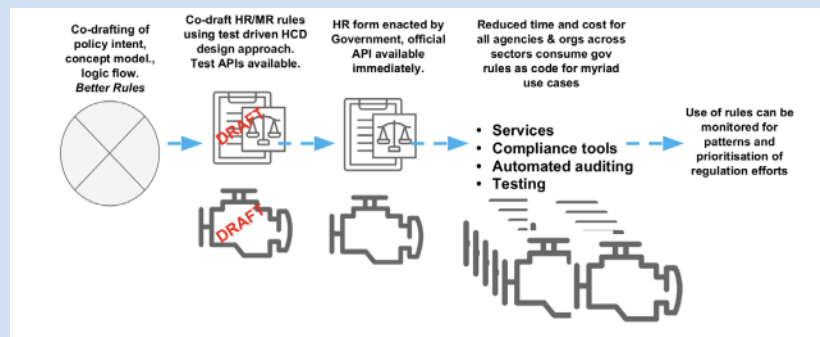
RULES AS CODE INTERNATIONALLY

Better Rules (New Zealand): Rules as Code within the Policymaking Process

In 2018, a multi-disciplinary group led by New Zealand government employees—including policy specialists, service designers, business analysts, legislative drafters, and software developers—developed an approach to policymaking designed so that human-readable rules would be written in tandem with machine-consumable code. Called “Better Rules,” this approach is designed to iterate and test for oversights or errors in rules before enactment, increase the fidelity between the intent of a rule and its implementation, and make the development of machine-consumable code from rules easier and more efficient to scale.^{103,104,105}

One of New Zealand's applications of the Better Rules approach is the [SmartStart](#) website, which accesses a rules engine to inform New Zealand parents, expectant parents, and caregivers what financial help and/or paid parental leave they may be eligible to receive from the government.^{106,107}

Better Rules, with its multidisciplinary basis and application of Rules as Code, is one approach to address the policy implementation gap noted by public interest technologists, in Code for America's [Delivery-Driven Policy](#)¹⁰⁸ and New America's [The New Practice of Public Problem Solving](#),¹⁰⁹ among other calls to action. Better Rules has been recognized as an international innovation by the OECD, and other nations including Canada and Australia have adopted similar approaches.^{110,111}



Above: A diagram showing how Rules as Code fits within New Zealand's Better Rules policymaking approach. Pia Andrews shared this diagram during an October 2020 webinar hosted by the OECD Observatory for Public Sector Innovation that introduced the working paper, “[Cracking the Code: Rulemaking for Humans and Machines](#).”^{112,113} [HR = human-readable, MR = machine-readable or machine-consumable, HCD = human centered design, API = application programming interface.]

103 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 22-23. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

104 Fraser, H. (2019). What is Better Rules? Digital.Govt.NZ. <https://www.digital.govt.nz/blog/what-is-better-rules/>

105 Webster, N. (2018). LabPlus: Better Rules for Government Discovery Report. Digital.Govt.NZ. <https://www.digital.govt.nz/blog/labplus-better-rules-for-government-discovery-report/>

106 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 22-23. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

107 New Zealand Government. (n.d.). SmartStart. <https://smartstart.services.govt.nz/financial-help/paid-parental-leave>

108 Code for America. (2019.) Delivery-Driven Policy. <http://s3-us-west-1.amazonaws.com/codeforamerica-cms1/documents/delivery-driven-policy-code-for-america.pdf>

109 McGuinness, T. & Slaughter, A.M. (2019). The New Practice of Public Problem Solving. Stanford Social Innovation Review, 17(2), 26-33. <https://doi.org/10.48558/X6SG-AC60>

110 Embracing Innovation in Government: Global Trends 2019. (2019). The Need For and the Potential of Innovation Has Never Been Greater. OECD. <https://www.oecd.org/gov/embracing-innovation-in-government-global-trends-2019.htm>

111 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 22-23. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

112 OECD Observatory for Public Sector Innovation. (2020, October 13). Cracking the Code: Rulemaking for Humans and Machines. [Webinar video]. Youtube. https://www.youtube.com/watch?v=-HUL3teHPw8&ab_channel=OECDObservatoryforPublicSectorInnovation

113 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42). <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

Call to Action 3: Create Incentives

ACTION

The act of the U.S. federal government creating rules as code does not ensure that states, local governments, and delivery organizations will adopt them. There must be incentives for these players to integrate the open source rules code and/or data feeds into their eligibility screening and enrollment software. Building on prior modernization efforts, the federal agencies can provide funding and support for pilots across programs and states to further develop the right rules as code technology infrastructure and policies.

IMPACT

- States are able to implement rules as code and modernize eligibility systems with funding and resources.
- Reduce duplication of efforts across states, local governments and delivery organizations to interpret and code eligibility requirements.
- Over the long term, reduce the overall cost of the administration of safety net programs for states and local governments.

Call to Action 4: New Policy Tools

ACTION

In addition to implementing rules as code for eligibility and enrollment systems, it can also be used to create new policy tools to allow policymakers, legislators, researchers, and residents to model and measure impacts of safety net policy changes. Using a rules-based tool, policymakers could test changes and impacts to rules, such as how policy changes may impact a household's eligibility, or evaluating when a household would hit a benefits cliff. This approach could also offer a robust feedback loop for policymakers by matching up eligibility rules and enrollment data to simulate how changes in policy would impact prior year's enrollment in a program.

IMPACT

- Allow for rapid code-based evaluation and impact assessment of policies and changes.
- Process large batches of case data or simulated data in a privacy-preserving way to model scenarios and see impacts.

RULES AS CODE INTERNATIONALLY

Open Fisca (France): A Rules as Code Platform

[Open Fisca](#) is a free, open source platform used to write rules as code that was developed by the French Government in 2011.¹¹⁴ Developers can work with policy experts to translate rules into code on the Open Fisca platform, or build applications that call coded rules in Open Fisca through a web API.^{115,116} They can also update these rules as policies and regulations change. Open Fisca was initially built to create tools for predictive policy analysis such as [LexImpact](#), a tool that allows members of France's parliament to simulate possible changes in tax law to better understand their potential impact on residents.^{117,118}

The platform has also been used to create multiple front-end applications for the public. These include the [Mes Aides](#) website, which lets French residents assess their eligibility for more than 30 public benefit programs and manage their program interactions.^{119,120} Mes Aides relies on benefit rules set by the French government and does not have to take into account state-level variations in benefit rules and implementation, like those that exist in the United States (federalism). However, French jurisdictions can develop local applications or access custom-made extensions to Mes Aides for benefits that are only available locally.¹²¹

The Open Fisca framework and open source code has now inspired groups in other countries to utilize the framework for new tools including [PolicyEngine](#), which seeks to help people understand and change policy through simulating their tax liability and benefit eligibility in the United Kingdom and United States.¹²²

114 The platform is maintained through a collaboration between beta.gouv.fr, the French government's digital services incubator; Etalab, the French government's department of open data and data policy; and the Agence Nationale de la Cohésion des Territoires, an organization that facilitates the implementation of projects in regions of France and in its territories.

115 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 40-41. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

116 Before You Start. (n.d.). Open Fisca. <https://openfisca.org/doc/>

117 Mohun, J. & Roberts, A. Cracking the Code: Rulemaking for Humans and Machines. OECD Working Papers on Public Governance (42), 51. <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>

118 beta.gouv.fr. (n.d.). LexImpact. République Française. <https://beta.gouv.fr/startups/leximpact.html>

119 (n.d.). République Française: My Social Rights. <https://www.mesdroitssociaux.gouv.fr/accueil/>

120 Showcase. (n.d.). Open Fisca. <https://fr.openfisca.org/showcase/>

121 Ibid.

122 Chenis, M. (2021). PolicyEngine's 2021 Year In Review. PolicyEngine. <https://blog.policyengine.org/policyengines-2021-year-in-review-cfb4893ecf2e>

Continuing the Conversation

The rules as code movement is nascent, but quickly growing and proving success in other countries. It is imperative that the United States begin formalizing an approach to adopting rules as code for the safety net to lessen the gap between policy and service delivery in digital systems.

As part of the Digital Benefits Network at the Beeck Center, we invite continued conversation and collaboration to spark the potential next steps of this work:

- Building on research with eligibility screening tools and international rules as code implementation, conduct research with states, territories, tribes, counties, and municipalities on eligibility and enrollment systems to uncover needs and replicable approaches for integrating rules as code. It will be important to document and incorporate what resources, leadership commitment, organizational culture, types of partners, and funding are key to successful implementation.
- Partner with universities and governments in countries that have successfully adopted rules as code to further explore application of their approaches in the U.S.
- Create a working group to explore centering equity in harmonizing the rules for core means-tested benefits.
- Create a working group to explore specifications for data standards for eligibility rules as code.
- Draft exploratory legislation for a rules a code requirement for public benefits
- Conduct a rules as code pilot with multiple benefits in 1-2 states, territories, tribes, counties, or municipalities and 1-2 delivery organizations, with built in measurement and evaluation to identify what works and can be scaled.

If you'd like to be part of continuing this work, please get in touch at beeckcenter@georgetown.edu.

Resources

RESOURCES FOR DRAFTING RULES AS CODE

- Rules as Code Talk Discussion Community. <https://talk.rulesascode.com/>
- The Basics of Symbolic Formal Logic as a Useful Tool for Legislative Counsel. By Matthew Waddington (2019). <https://legislativedrafter.files.wordpress.com/2021/10/logic-for-legislative-drafters-loophole-2021-02.pdf>
- The Practical Better Rules Workshop Manual. By Hamish Fraser. <https://betterrules.nz/workshop-manual.html>
- The Rules as Code Handbook. By the Rules as Code League. <https://github.com/Rules-as-Code-League/RaC-Handbook/wiki/1-Introduction:-What-is-Rules-as-Code%3F>
- Machine-Consumable Legislation: A Legislative Drafter's Perspective – Human v. Artificial Intelligence. By Matthew Waddington (2019). Pages 21 - 52. <https://www.calc.ngo/sites/default/files/loophole/Loophole%20-%202019-02%20%282019-06-24%29.pdf#page26>
- Rules as Code – Seven Levels of Digitisation. By Meng Weng Wong (2020). https://ink.library.smu.edu.sg/sol_research/3093/

GLOBAL EXAMPLES OF RULES AS CODE

- Cracking the Code: Rulemaking for Humans and Machines. By James Mohun & Alex Roberts, OECD Working Papers on Public Governance No. 42 (2020). <https://www.oecd.org/innovation/cracking-the-code-3afe6ba5-en.htm>. Webinar that introduces the report (2020). <https://www.youtube.com/watch?v=-HUL3teHPw8>
- Rules as Code – Test, Learn, Repeat. From the Australian Policy Lab and Digital.NSW Accelerator (2019). <https://www.digital.nsw.gov.au/article/rules-code-test-learn-repeat>
- Reflections on Rules as Code. (Canada). By Scott McNaughton (2020). <https://scottamcnaughton.medium.com/week-50-reflections-on-rules-as-code-5878ff42d43c>
- Digital-Ready Legislation. From the Danish Agency for Digitisation. <https://en.digst.dk/policy-and-strategy/digital-ready-legislation/>
- Evaluation of the Effort to Make Legislation Digital-Ready. From the Danish Agency for Digitisation (2021). <https://en.digst.dk/media/24344/evaluation-of-the-effort-to-make-legislation-digital-ready-accessible-version.pdf>
- Open Fisca. (France). <https://openfisca.org/en/index.html> and resources, including a Slack signup <https://openfisca.org/doc/find-help.html>

- **What Is Better Rules? (New Zealand).** By Hamish Fraser (2019). <https://www.digital.govt.nz/blog/what-is-better-rules/>
- **Machines Are Users Too: Legislation as Code and Better Rules.** (New Zealand). By Pia Andrews (2020). <https://drive.google.com/file/d/1HdQjTjhHGAIrnOMrdFzawMI0zQp8NI0z/view>
- **LabPlus: Better Rules for Government Discovery Report.** (New Zealand). By Nadia Webster (2018). <https://www.digital.govt.nz/blog/labplus-better-rules-for-government-discovery-report/>
- **Blawx: Rules as Code Demonstration.** (United States). By Jason Morris (2020). <https://law.mit.edu/pub/blawxrulesascodedemonstration/release/1>

INFORMATION ON U.S. ELIGIBILITY SCREENING TOOLS

NYC Mayor's Office for Economic Opportunity

- **ACCESS NYC.** <https://access.nyc.gov/>
- **Benefits Platform Screening (Eligibility) API.** <https://screeningapidocs.cityofnewyork.us/>
- **Eligibility Guidelines.** <https://screeningapidocs.cityofnewyork.us/eligibility-guidelines>
- **Report: Benefits Access in New York City – Local Law 60** (2018). <https://www1.nyc.gov/site/opportunity/reports/local-law-60.page>

18F

- **Eligibility APIs Initiative.** <https://portfolios.18f.gov/projects/eligibility-apis/>
- **Exploring a New Way to Make Eligibility Rules Easier to Implement.** By Ed Mullen (2018). <https://18f.gsa.gov/2018/10/16/exploring-a-new-way-to-make-eligibility-rules-easier-to-implement/>
- **Implementing Rules Without a Rules Engine.** By Ed Mullen (2018). <https://18f.gsa.gov/2018/10/09/implementing-rules-without-rules-engines/>
- **Rapid Implementation of Policy as Code.** By Alex Soble and Mike Gintz (2020). <https://18f.gsa.gov/2020/05/12/rapid-implementation-of-policy-as-code>

Benefits Data Trust

- Benefits Launch Express. <https://cwf.benefitslaunch.org/>
- Unite Us and Benefits Data Trust Partner to Offer the First Nationwide Coordinated Care Network with an Embedded Benefits Access Solution (2018). <https://bdtrust.org/unite-us-and-benefits-data-trust-partner-to-offer-the-first-nationwide-coordinated-care-network-with-an-embedded-benefits-access-solution/>

Alluma

- One-x-Connection. <https://www.alluma.org/oxc>
- Quick Screener. <https://www.alluma.org/alluma-quick-screener>
- Integrated Eligibility Systems (IES) Principles. <https://www.alluma.org/ies-solutions-people-first>
- Integrated Benefits Eligibility Mapping. <https://www.alluma.org/integrated-benefits-eligibility-mapping>
- One-x-Connection Design Principles and Architecture. https://www.alluma.org/sites/default/files/2020-06/alluma_oxc_design_architecture_0.pdf

mRelief

- mRelief Screener and Application. <https://www.mrelief.com/>

RESEARCH ON CROSS ELIGIBILITY AND ENROLLMENT

- **The Supplemental Nutrition Assistance Program (SNAP): Categorical Eligibility.** From the Congressional Research Service (2019). <https://sgp.fas.org/crs/misc/R42054.pdf>
- **Promoting Public Benefits Access Through Web-Based Tools and Outreach: A National Scan of Efforts. Volume I: Background, Efforts in Brief, and Related Initiatives.** Produced for the U.S. Department of Health and Human Services (2011). <https://aspe.hhs.gov/reports/promoting-public-benefits-access-through-web-based-tools-outreach-national-scan-efforts-volume-i-0>
- **Improving Access to Public Benefits: Helping Eligible Individuals and Families Get the Income Supports They Need.** From the Annie E. Casey Foundation, the Ford Foundation, and the Open Society Institute (2010). <https://www.aecf.org/resources/improving-access-to-public-benefits#key-takeaway>

- **Mapping the Applicant Experience of Benefit Enrollment.** From the U.S. Digital Service and the Centers on Medicare and Medicaid Services (2016). <https://usds.github.io/benefits-enrollment-prototype/assets/discovery-findings-mapping-enrollment-Nov2016.pdf>
- **Opportunities to Streamline Enrollment Across Public Benefit Programs.** From Social Interest Solutions (now Alluma) and the Center on Budget and Policy Priorities (2017). <https://www.cbpp.org/research/poverty-and-inequality/opportunities-to-streamline-enrollment-across-public-benefit>
- **Maximizing Linkages: A Policymaker’s Guide to Data-Sharing.** From Social Interest Solutions (now Alluma) (2019). <https://www.alluma.org/maximizing-linkages-policymakers-guide-data-sharing>