AHRQ Offerings & the Knowledge Ecosystem Cycle (Appendix F of Roadmap)

This appendix describes in more detail key AHRQ offerings and initiatives that support the knowledge ecosystem cycle.

Full LHS Cycle

ACTS COVID19 Collaborative Learning Community

The AHRQ ACTS COVID19 Collaborative Learning Community (55) is a learning community helping improve the data to evidence to guidance to action and back to data LHS cycle for COVID19 that seeks to cross-fertilize and accelerate current efforts to develop, deliver, and apply the latest COVID19 evidence-based guidance and tools; measurably improve care and outcomes for COVID19 patients and care teams in ways that can scale to other clinical targets and settings; and advance tools, standards, and collaborations that seed the DKPs, knowledge ecosystem, reference architecture, and PPP called for in the ACTS Roadmap. This Collaborative is bringing together leaders from around the world in each knowledge ecosystem cycle step to improve how the cycle works in the near term for pressing COVID19 patient management issues (e.g., use of anticoagulants and risk assessment for triage decisions). This effort provides a framework and concept demonstration for how the ACTS Roadmap efforts can support the computability and seamless interoperability opportunities for AHRQ tools and resources—individually and collectively.

Synthesize Evidence

AHRQ-Funded Research

AHRQ invests tens of millions of dollars per year to produce research on topics including heath IT/digital healthcare, patient safety, health services research, prevention, and care management (329). Finding and applying results from this research (e.g., for use in producing systematic reviews or applying it to QI or policy making) is a cumbersome, manual process. GOLD database has search capability, but it's difficult to find the information needed to address one of these needs (e.g., NIH RePORTER (330) (331) h as information about studies from AHRQ and others).

EPCs

AHRQ EPCs (77) conduct comprehensive systematic reviews of all relevant scientific literature on a wide spectrum of clinical and health services topics and produces technical reports on methodological topics and other types of evidence synthesis-related reports.As part of the AHRQ Effective Healthcare Program (44), EPCs conduct comprehensive systematic reviews of all relevant scientific literature on a wide spectrum of clinical and health services topics and produces technical reports on methodological topics and other types of evidence synthesis-related reports.
EPC reports can be dozens of pages long and difficult for users to access needed information. The EPC program is producing a dynamic webbased framework to provide visual and interactive display of report findings to promote their dissemination and uptake (332). This work is not addressing the computability of this information (i.e., so that systematic reviews could be created more efficiently through automated access to study information for synthesis or providing report output in a computable form for automated delivery to guideline development platforms).

Effective Healthcare Program

The AHRQ Effective Healthcare Program (44) provides evidence on the outcomes, benefits and harms, and appropriateness of drugs, devices, and healthcare services and helps healthcare professionals, patients, policymakers, and healthcare systems make informed healthcare decisions by partnering with research centers, academic institutions, health professional societies, consumer organizations, and other stakeholders to conduct research, evidence synthesis, evidence translation, dissemination, and implementation of research findings.

Produce Guidance

CQuIPS

It can be difficult for those who can benefit from these tools to know they exist, find them, understand their use in context of other related resources tools, and integrate them into quality and safety improvement workflows. AHRQ CQuIPS (47) conducts and supports user-driven research on patient safety and healthcare quality measurement, reporting, and improvement. CQuIPS provides safety and QI tools such as the Comprehensive Unit-based Safety Program (CUSP) (333), strategies for improving patient experience (334), and others (see Table B-7. Current AHRQ (& Other) Resources for LHSs for a broader sampling of QI resources from AHRQ). The next generation of CQUIPS Patient Safety QI and PS websites are currently under development.

USPSTF & Enhanced Dissemination Efforts

USPSTF (65) is an independent, volunteer panel of national experts in disease prevention and EBM that works to improve the health of all Americans by making evidence-based recommendations about clinical preventive services.
USPSTF held a Digital Health Forum in 2019 (335) to build a collaboration between the USPSTF and digital health leaders to ensure all Americans get the best preventive care based on up-to-date, evidence-based recommendations. Experts and stakeholders discussed how to leverage digital solutions and make evidence-based recommendations more directly shareable and consumable in a feasible manner, while minimizing duplication of efforts across technology platforms.
There has been limited progress to date in making USPSTF guidance development and dissemination more efficient and effective by making it more computable in a standards-based manner. For example, having computable systematic reviews feed directly into tooling to create computable guidance, which then flows seamlessly into tools for creating CDS interventions and eCQMs based on the guidance. There likewise isn't a mechanism for gathering the results from implementation of those measures and interventions and leveraging that to further inform recommendation updating

Make Guidance Computable

CDS Connect Authoring Tool

AHRQ CDS Connect Authoring Tool (46) was a pilot that accounted for the Agile nature of CDS development, including clinical and technical translation of guidelines into computable CDS, testing and monitoring, implementation protocols, and feedback loops, which produced a freely available, web-based platform for sharing interoperable CDS, including a CDS authoring tool and multiple open-source software packages, where CDS developers interested in sharing and disseminating CDS with CDS implementers who may reuse the CDS for further innovation and local adaptation.
The tool provides an interface for creating CDS logic using simple forms and exporting it as HL7 CQL (336) artifacts using the HL7 FHIR (337) data model for integration with EHRs.
As part of CDS Connect sustainability efforts, AHRQ will explore stakeholder needs for additional functionality related to creating CDS interventions. It's not clear at present whether/how AHRQ/CDS Connect would address comprehensive address user needs related to creating all types of CDS interventions (see Table B-1. Interventions Underlying the Future Vision for examples of CDS intervention type needed). In any case, next steps to support CDS/eCQM authoring will need to be coordinated with other efforts to make the knowledge ecosystem cycle computable in order to ensure seamless interoperable information flow around the entire cycle. The ACTS Roadmap execution plan will align with and leverage future AHRQ efforts around making CDS Connect sustainable, leveraging a PPP to govern a future CDS Connect platform, and establishing a CDS Connect innovation collaborative.

CEPI Evidence Discovery & Retrieval (CEDAR)

AHRQ CEDAR (42) makes PCOR findings within AHRQ repositories more FAIR through technologies used by clinicians, researchers, implementers, patients, and others; specifically, a prototype infrastructure that demonstrates standards-based, API-enabled discovery and retrieval of underlying PCOR findings within CEPI repositories, such as the EPC program, USPSTF recommendations, and CDS Connect.
"Specifically, this work will develop prototype infrastructure that demonstrates standards-based, API-enabled discovery and retrieval of underlying PCOR findings within CEPI repositories, such as the EPC program, USPSTF recommendations, and CDS Connect. Deliverables include an environmental scan and gap analysis, a reference implementation for the prototype infrastructure/API, a pilot demonstration, and publicly available documentation and reports."
This work is one key component of ensuring that the evidence and guidance is produced more efficiently/effectively, leveraged to improve care processes and outcomes, and broadly used/useful and integrated/coordinated with interdependent components of the knowledge ecosystem (e.g., other API mechanisms for evidence/guidance FAIRness). Realizing optimal benefits from CEDAR require that the API is produced and evaluated in the context of the full ecosystem cycle (e.g., to ensure smooth interoperability all the way around the cycle).
The ACTS Roadmap amplifies the value of this important AHRQ evidence/guidance FAIRness enhancement with a wider focus around ensuring that the evidence and guidance is produced more efficiently/effectively, leveraged to improve care processes and outcomes, and broadly used/useful and integrated/coordinated with interdependent components of the knowledge ecosystem (e.g., other API mechanisms for evidence/guidance FAIRness).

Disseminate Evidence & Guidance

CQuIPS

AHRQ CQuIPS (47) develops and disseminates reports and information on healthcare quality measurement, reporting, and improvement.

SRDR+

AHRQ SRDR+ (43) is a collaborative, web-based repository of systematic review data and tool for the extraction and management of data for systematic reviews that provides improved access to data by consumers of review evidence, promotion of transparency and reliability in the systematic review process via communal review, enhanced cooperation and utilization across related resources (such as ClinicalTrials.gov), and a more efficient means of producing and updating systematic reviews. The SRDR+ team is developing mechanisms for making data in SRDR+ more computable in ways that leverage FHIR evidence-related standards (see EBMonFHIR/COVID Knowledge Accelerator (140)). This work will need to be coordinated with other efforts to make knowledge ecosystem cycle steps more computable, so that information can flow seamlessly around the entire cycle. The ACTS Roadmap execution plan will align with and leverage AHRQ efforts by Brown University to enhance the SRDR+ platform.

CDS Connect Repository

The AHRQ CDS Connect Repository (49) was a pilot that accounted for the Agile nature of CDS development, including clinical and technical translation of guidelines into computable CDS, testing and monitoring, implementation protocols, and feedback loops, which produced a freely available, web-based platform for sharing interoperable CDS, including a repository, where CDS developers interested in sharing and disseminating CDS with CDS implementers who may reuse the CDS for further innovation and local adaptation.
As part of CDS Connect sustainability efforts, AHRQ will explore stakeholder needs for additional functionality related to sharing CDS interventions. It's not clear at present whether/how AHRQ/CDS Connect would address comprehensive user needs related to marketplace functions for CDS artifacts (See Appendix D, Marketplaces). In any case, next steps to support CDS sharing will need to be coordinated with other efforts to make the knowledge ecosystem cycle computable in order to ensure seamless interoperable information and tool flow around the entire cycle.

PCCDS-LN

AHRQ PCCDS-LN (96) proposed the establishment of a knowledge network to guide the development of a cohesive and standards-based CDS knowledge ecosystem.

AI, Machine Learning (ML), Natural Language Processing (NLP) Search Tools

The AHRQ DKP promotes findability by providing a search and automatic tagging component that effectively leverages AI, ML, and NLP tools—including controlled vocabularies and learning from user search histories—to easily classify and provide access to AHRQ evidence, guidance, tools, and other knowledge resources. AHRQ is leveraging and considering existing tools such as Booz Allen Hamilton's DEXi (338), Amazon, and Google AI, ML, and NLP platforms.

NGC Next-Gen

The ACTS Roadmap execution plan will align with and leverage future efforts to build an open, standardized, next-generation version NGC system that seamlessly integrates with all AHRQ evidence, guidance, CDS interventions, quality measures, and other related websites, and applies API and portal technology where appropriate. This next-generation NGC will be governed to ensure that appropriate guidelines are vetted for trust and selected for, included in, and distributed from NGC to support the development of CDS interventions. The future NGC will be a key component of the knowledge ecosystem, leveraging its reference architecture, adhering to standards that support computability and FAIRness, leveraging metadata standards for tagging guidelines, and leveraging functionality enhancements in alignment with the ACTS Future Vision recommended by the Roadmap Execution Steering Committee/PPP.

Implement Guidance

AHRQ–NIH NIDDK eCarePlan Project for MCC

The AHRQ–NIH NIDDK eCarePlan project for MCCs (104) is an open-source SMART-on-FHIR-based electronic care plan application developed to enable clinicians to better manage patients with MCC, including chronic kidney disease (CKD), type 2 diabetes (T2D), CVD, pain and OUD, aligned with emerging industry standards with the goal of creating publicly available, scalable artifacts and services that could be used nationwide. AHRQ /NIDDK eCare Plan Project (50) is developing eCare plans as IT-enabled tools to support seamless care coordination, communication, and collaboration among members of the care team (patients, caregivers and providers) to address the full spectrum of a patient's needs across all settings and over time. The eCare plan will be used by clinical practices and health systems to compile, review, update and exchange critical patient health data and treatment plans. Although the project's core focus is to facilitate aggregation and sharing of critical patient data and treatment plans, the tooling produced will be a powerful opportunity to connect treatment plans with patient-centered evidence and guidance. Capitalizing on the opportunity—and project goals related to building data capacity for conducting pragmatic, patient-centered outcomes research—requires seamless interoperability of clinical evidence/knowledge and patient data around the entire knowledge ecosystem cycle.

CQuIPS

AHRQ CQuIPS (47) collaborates with stakeholders across the healthcare system to implement evidence-based practices, accelerating and amplifying improvements in quality and safety for patients.

EvidenceNOW

This AHRQ grant initiative is dedicated to helping small- and medium-sized primary care practices across the country use the latest evidence to improve the heart health of millions of Americans (66). It includes "Tools for Change" (75) to help primary care practices improve care. AHRQ is building on the EvidenceNOW model (339) to address research gaps and other important work (340).

Analyze & Improve Care Results

CFACT Insight Engine

AHRQ's CFACT (79) (e.g., Insight engine) conducts, supports, and manages studies of the cost and financing of healthcare, the access to healthcare services and related trends. AHRQ's Insight Platform uses publicly available data and analytic tools, supported by the Agency's information technology infrastructure and in-house industry experts, who are able to provide information and obtain evidence-based answers to questions about the healthcare system. A 2019 AHRQ leadership blog post (51) noted that AHRQ is "committed to a vision in which AHRQ's data capabilities will grow in ways that align with the rapid advances in the Nation's digital healthcare ecosystem." From the perspective of the knowledge ecosystem cycle, this require considering how efforts to make data about healthcare processes and outcomes more computable using widely adopted standards can support input to AHRQ's data and analytics platform. And likewise, how such computable data flowing out of this Insight Platform can support continuous improvements in care delivery and outcomes in a virtuous cycle around the knowledge ecosystem. The ACTS Roadmap execution plan, in particular the AHRQ DKP, will align with and leverage the next-generation AHRQ Insight platform (51), which focuses on creating insights from MEPS (341), Hospital Cost Utilization Program (HCUP) (342)), SDOH, and other related cost and care utilization feedback data.

CQuIPS

AHRQ CQuIPS (47) assesses CQuIPS practices to ensure continuous learning and improvement for CQuIPS and its members. CQuIPS produces reports on care results including the National Healthcare Quality and Disparities Report (343), and the Consumer Assessments of Healthcare Providers and Systems (CAHPS) (344). These reports are important indicators of how the U.S. healthcare system is performing overall and more local regions. They are thus valuable resources identifying and addressing opportunities for improvement. Leveraging standards-based, computable data for inputs and outputs and other enhanced data management approaches would make it easier for stakeholders to access information most helpful for addressing their particular needs and integrate it with other related information. Enhancing FAIRness, computability, and seamless interoperability with non-AHRQ sources of this important information would enhance AHRQ's contribution to a virtuous LHS/Knowledge Ecosystem Cycle.

U.S. Health Information Knowledgebase (USHIK)

USHIK is a "an online, publicly accessible registry and repository of healthcare-related metadata, specifications, and standards. USHIK is funded and directed by the AHRQ with management support and engagement from numerous public and private partners." (345)