**Comments on the ONC Interoperability Roadmap**

**by David Tao for himself and on behalf of ICSA Labs**

**Thank you** for the opportunity to comment. I worked in HIT for 35 years for Siemens Health Services, focusing on interoperability and standards since 2005. I have participated in many interoperability efforts including HL7, IHE, CCHIT, HITSP, Direct Project, S&I Framework, EHRA. Most recently I served on the HITSC’s Standards and Interoperability Framework Task Force. Since retiring from Siemens, I have been a technical advisor to ICSA Labs, an ATL and ACB that has insights on the ONC certification criteria and processes.

The Roadmap is a Herculean effort, and I commend ONC who listened to **many** stakeholders and analyzed the strengths and weaknesses of our interoperability journey thus far. ONC has proposed a balanced, forward-looking, yet practical and actionable, path forward to improve interoperability. **I strongly support the goals of the Roadmap.** If I did not, I wouldn’t have written 10 pages of comments in hopes of making it still better!

I will first address a few “Questions on the Roadmap” that were posed on pages 6 and 7. However, most of my comments on those and other topics are organized by major sections of the Roadmap, and then by page number, so I can answer them specifically in context. I use *italics* to identify direct quotes from the Roadmap.

**ANSWERS TO ONC’S “QUESTIONS ON THE ROADMAP”**

**General**

*Are the actions proposed in the draft interoperability Roadmap the right actions to improve interoperability nationwide in the near term while working toward a learning health system in the long term?*

*What, if any, gaps need to be addressed?*

1. Guidance on what is appropriate to include (and what should be excluded) for transitions of care, to make ToC interoperability relevant, useful and usable
2. Best practices and implementation guidance for clinical information reconciliation, starting with problems, medications, and allergies
3. Prioritization regarding which specific categories of unstructured narrative should be exchanged.
4. More focus on improving patient matching. See detailed discussions below.

*Is the timing of specific actions appropriate?*

While the Roadmap is aggressive in many ways, it is OK to set “stretch goals” in a Roadmap that align with the vision set forth in the Federal HIT Strategic Plan. Market forces and the capability of the industry to absorb change may change the timelines. Care must be taken, however, to avoid premature certification and other regulatory pressures to “force the Roadmap to happen” where mature (proven, implemented) standards and necessary infrastructure don’t exist yet.

*Are the right actors/stakeholders associated with critical actions?*

The first Critical Actions table (Table 2) is clearly organized by stakeholder, but most of the others are organized by topic. While it is reasonable to organize tables by topic, I recommend **adding (perhaps in an Appendix) an alternate view that organizes all critical actions for each stakeholder**, e.g., SDOs, Certification Bodies, HIT Developers, Providers, ONC and each Federal agency, etc. This would expose whether each stakeholder’s set of responsibilities is feasible: without such a view, it is very hard to assess whether the Roadmap is appropriately balanced.

**Priority Use Cases**

*Appendix H lists the priority use cases submitted to ONC through public comment, listening sessions, and federal agency discussions. The list is too lengthy and needs further prioritization. Please submit 3 priority use cases from this list that should inform priorities for the development of technical standards, policies and implementation specifications.*

See comments on Appendix H below

**Governance**

*The draft interoperability Roadmap includes a call to action for health IT stakeholders to come together to establish a coordinated governance process for nationwide interoperability. ONC would like to recognize and support this process once it is established. How can ONC best recognize and support the industry-led governance effort?*

As a member of the recent Standards and Interoperability Task Force (SITF) commissioned by the HIT Standards Committee, I support the recommendations SITF made in its transmittal letter to ONC. I feel most strongly about the following points:

* Assemble business/clinical stakeholders through the “Convening Function” identified by the SITF, to support national priorities and to ensure that a small set of the top priority projects meet the criteria for “what must be true of an identified national priority” before being undertaken by S&I. This function should work closely under the oversight of the HITPC and HITSC (or a designated steering committee) to ensure that S&I is truly focused on the highest nationwide priorities.
* Support pilots, reference implementations, and evaluation of stakeholders’ experiences using the standards. Ensure that standards are well vetted and successful in real implementations at reasonable scale **prior** to incorporating standards via regulation.
* Participate actively in SDOs, and coordinate/harmonize the inputs of all Federal Agencies (which may individually participate too).
* Ensure that the S&I convening function leverages the strength of the current S&I process to engage users who might not be able to participate in SDOs; improve the process by maintaining balanced stakeholder involvement throughout the lifecycle.
* Support (possibly through funding or incentives) shared interoperability infrastructure interoperability for the public good. “Infrastructure” means the actual systems (not the standards) that can be used by stakeholders which are difficult for individual SDOs or HIT vendors to create. Examples: provider directories (such as NPPES), record locators, and repositories of terminology, value sets, and knowledge (e.g., National Library of Medicine’s VSAC).

**Supportive Business, Cultural, Clinical and Regulatory Environments**

*How can private health plans and purchasers support providers to send, find or receive common clinical data across the care continuum through financial incentives? Should they align with federal policies that reinforce adoption of standards and certification?*

Yes, I endorse alignment wherever possible across public and private sectors. A similar question should be asked about what State-based HIEs and public health agencies can do. In many instances they do not currently align with federal policies and ONC standards. While some may participate in SDOs, it would be good for ONC to formally convene and seek harmonization across states, or at least expose the extent of variation, before proposing regulations that have little chance of practical implementation without customization. Formal engagement with groups such as the EHR/HIE Interoperability Workgroup and other consortia of states would help. While ONC’s State HIE Program has published many reports, I’m not aware of them focusing on the issue of discrepancies across states that inhibit “out of the box” use of the interoperability standards in Meaningful Use. Also, there are some areas beyond MU (e.g., transport to public health agencies) where there is reportedly still much variability that increases the complexity and cost (to providers and/or developers) of exchange.

**Core Technical Standards and Functions**

*Which data elements in the proposed common clinical data set list need to be further standardized? And in what way?*

See detailed comments in the Core Technical Standards and Functions section below.

*Do you believe the approach proposed for Accurate Individual Data Matching will sufficiently address the industry needs and address current barriers?*

No, it would help but would fall short of what is needed. See detailed discussion regarding Roadmap pages 90 and following.

**Certification and Testing**

*In what ways can semantic interoperability be best tested? (e.g., C-CDA content and semantics)*

It is very difficult to test semantic interoperability with the current wide amount of allowable variation in CCDA (document types, multiple ways to send the same data, optionality). Simply forcing EHRs to undergo much more demanding testing **now** (processing a wide range of variations in CCDA) would not be wise. It would probably produce the discouraging result that many EHRs can’t pass the test. Then what would that means, since they’re already certified HIT?

Rather, I suggest a multifaceted approach to address the CCDA semantic interoperability challenge.

1. There should be focused effort (ONC and NIST and possibly an HITSC Work Group or Task Force working closely with HL7) to address the top priority “ambiguity” issues that have been raised through various analyses of CCDA and MU2 (e.g., SMART report, presentations given by Mark Roche to HITSC Implementation WG, , recent recommendations from the HITSC Implementation Certification and Testing WG). These should be reflected in more “normative” implementation guidance than has been issued thus far (the S&I Framework CCDA Companion Guide for MU2 was informative).
2. Then rather than boiling the ocean by trying to solve “semantic interoperability” in its entirety, focus on the issues of consuming problems, allergies, and medications. After that, address more categories of data (whatever is most important to import and/or reconcile). To my knowledge, the industry has not yet agreed upon a prioritization for additional categories of data: it needs use cases to help move away from general complaints to actionable plans, then to implementation.
3. Based on the results of those efforts, with a tighter set of constraints and a bounded problem space, new validation tools should be created. While they will still have to deal with some variations, it should be much less variability than currently exists.

See more detailed comments on pages 80-81 below.

**DETAILED COMMENTS BY ROADMAP SECTION AND PAGE NUMBER**

# Executive Summary

* **HARMONIZE DATES BETWEEN TITLES AND CONTENTS**  
  The dates of in the titles of both the Roadmap and the Federal IT Strategic Plan seem inappropriate. Why 2015-2020? FHIT Strategic Plan has 3, 6, and 10 year goals (which correspond to 2017, 2020, and 2024 since the plan was first published in 2014). I suggest that the dates be 2015-2024 to align with the three timeframes shown in the tables.
* **ADDRESS USABILITY OF INTEROPERABILITY CAPABILITIES**  
  P. 10 – *“There are also many aspects of health IT beyond interoperability that are important and will be critical to a learning health system, including technology adoption, data quality,* ***usability and workflow.*** *However, these topics are out of scope for this Roadmap at this particular time and deserve separate, dedicated attention.”*   
  Usability and workflow are OK to be out of scope IN GENERAL, but they should NOT be out of scope for the Roadmap inasmuch as they impact interoperability. It is well known, from providers’ MU2 experiences, that usability difficulties in the Transitions of Care objective have hindered meaningful information exchange. On the bottom of page 10 and top of 11, the Roadmap acknowledges “*workflow difficulties automating the presentation of externally derived electronic health information”* and page 13 commendably says “*implement standards in a manner that makes sharing and receiving electronic health information* ***easy for users****.*” To the extent that workflow difficulties and “not easy for users” prevent interoperability, solutions to these problems SHOULD be within the Roadmap’s scope. As a specific example: the Roadmap should recommend the creation of implementation guidance for “rightsizing” the information included in a clinical summary (not just what types of data, but also time ranges, statuses, etc.), as well as what should NOT be included (while always allowing for clinician discretion). It should also recommend similar guidance to help providers and others “find and **use**” the right information when querying externally, since the unfiltered results of query to multiple data sources could overwhelm the user, waste their time, and discourage them from even trying to do future queries. Similarly, it should not be sufficient to educate **users** deal with unusable systems; rather, HIT **developers** should also be given guidance (perhaps an add-on to the SAFER Guides) on how to create systems in which key interoperability functions can be performed with minimal effort. Note that “implementation guidance” need not be regulatory and should not be overly prescriptive: however, it will be helpful for ONC to sponsor, recognize, and disseminate best practices. The Roadmap should emphasize that “exchange” alone is not the goal, but rather “exchange **and use**” – and **use** requires usability.
* **RECOGNIZE THE CLINICAL VALUE OF HUMAN LANGUAGE (NARRATIVE)**  
  P. 10 says *“Electronic health information is not sufficiently structured or standardized and as a result is not fully computable when it is accessed or received. That is, a receiver’s system cannot entirely process, parse and/or present data for the user in meaningful and useable ways.”*   
  The above statement is overreaching: it implies that electronic health information SHOULD “entirely” be “fully computable” and “parsed.” While that is true for some data, much of the data most desired by practicing physicians (not just medical informaticists) are inherently or primarily narrative (e.g., physicians’ progress notes, patients’ observations of outcomes). These narrative components are “meaningful” and useful when simply shared and presented as is, without having to be “fully computable.” In several FACA hearings, physicians have spoken of receiving previous physicians’ notes as the most important information to help treat their patients.   
    
  The Interoperability Roadmap and HIT standards are written in English and convey what they intend: they may have structured parts (e.g., conformance statements) but need not be entirely “parsed” and “fully computable.” There can be keyword tagging of narrative (as is done to assist search engines, which operate on far larger volumes of unstructured web pages than exist in a patient’s records). But structured data and keywords do not come close to replacing the expressivity of human language and its ability to “tell a story” vs relying solely on codes, lists and tables.

Narrative data’s problem is not that it is unstructured, but **that it often does not get shared.** Up till now narrative has been omitted from the Common MU2 Data Set, and is probably not sent by many EHRs during transitions of care. On page 12 the proposed Common Clinical Data Set includes “Narrative/Notes.” This is progress over MU2 but is too vague, tantamount to saying “structured data” without specifying meds, lab results, etc. I suggest that the Roadmap identify the top priority **specific** types of narrative that should be sent, received, found, and used. Candidates from which to select the top priorities include **progress notes**, assessment, **hospital course (course of care), chief complaint,** subjective, **reason for visit, reason for referral,** history of past illness, **history of present illness,** advance directives, and **instructions.** While I suggest the ones in **bold** as top priorities, the prioritization should be made by surveying practicing clinicians.

# Roadmap Introduction

* P. 20 – Principle One (build upon existing infrastructure) is good. It is very important to avoid “rip and replace” approaches. However, the Roadmap should articulate that **some** infrastructure can be “net new” (e.g., directories, new cloud-based services) because equivalents weren’t possible or weren’t adopted previously. Also, **some** infrastructure can be “replaced” as long as there are not too many changes simultaneously, which would disrupt the entire system. E.g., you can replace the roof of your house, or install a new HVAC system, but you don’t want to blow up the entire house while still living in it. This is similar to Principle 6, modularity. Where new or replaced infrastructure is proposed, that is where a Roadmap is very helpful to give a signal to the industry.
* P. 20 Principle 2 says “*vary the usability*” but should rather say “vary the **user experience**.” Usability will, of course, vary, but that is not something done intentionally.
* P. 21 Principle 8 is commendable. But it is not enough to “offset resource investment,” rather the Roadmap should seek the **optimal** investment in a rank ordered priority, given that there are never enough resources to do every “worthwhile” thing. Thus there needs to be a way to measure value and make tradeoffs to focus on the best among many good potential HIT initiatives.

# A Shared Nationwide Interoperability Roadmap

## Rules of Engagement and Governance

See my answer to the **Governance** question at the beginning of this letter.

## Supportive Business, Clinical, Cultural and Regulatory Environments

* 39 – LTPAC and Behavioral Health are among the most significant cost drivers, yet unaddressed by MU thus far. CCDA 2.0 had excellent involvement from the clinical community, particularly LTPAC and Behavioral Health, through the S&I LCC initiative. It defined new document types specific to transfers to LTPAC (the Transfer Summary) and new/improved Mental Health templates. Some of these have also been piloted. So I suggest that the Roadmap encourage and possibly incent HIT developers and LTPAC/BH providers to leverage this work. A “push” of the Transfer Summary to LTPAC can be supplemented by targeted queries and/or additional “push” documents (e.g., Op Notes, Progress Notes) as more information beyond the summary is needed. I believe that there is not widespread agreement on categorizing mental health data yet, so I recommend starting with simple exchange of information (mostly narrative is fine).
* 43 – Item 7 in the middle column speaks of *“necessary, standardized clinical data…”* Standardized, yes, but that should not imply “one size fits all” in actual usage. When exchanging information for transitions of care, providers must consider (and vendors must enable) relevant and usable information to be sent. While EHRs must be certified to be **capable** of sending all data required for MU, any given INSTANCE of a ToC may not call for it, as is already well explained in the Appendix of the ToC Companion Guide to CCDA for MU2. The Roadmap considers new *“conditions of participation and/or guidance through surveys and certification”* among which ONC should recognize and support efforts (such as the “Pertinent and Relevant” project recently started in HL7) to address this issue.
* 47, category C1. Items 3, 4, and 5 should be enhanced to reference the “*care and service delivery system*” and “*care and service teams*” rather than only care delivery, since individuals wellness, access to health care, and health-related costs, are affected by many services beyond direct healthcare, as the S&I Framework eLTSS initiative is defining.
* 48 – Item 7 in middle column speaks of *“compiling health info from multiple sources in one place*…” This is good but perhaps too narrow. The Roadmap should encourage innovative solutions to the problem of fragmentation of a patient’s record among many “silos” that make it hard to decide the “source of truth.” These approaches might include, but are not limited to, HIEs, PHRs, Health Data Banks, and a **virtual** health record that leverages services, record locators, etc. Compiling all the information into once place is one approach, but should not be assumed as the only approach.
* 50 – *“This Roadmap shifts the nation’s focus from meaningfully using specific technologies with specific features to working together as a nation to achieve the outcomes desired from interoperability and a learning health system.”* I commend this approach. However, as I comment in the “Tracking Progress and Measuring Success” section, there should be a process to focus on specific outcomes (not just “outcomes in general”), set targets, and measure them over time.
* 53, item D4. **Reconciliation of clinical information** is a current MU2 certification requirement for which no guidance has been provided. As information exchange increases and “the floodgates open” there must be more attention to how to perform reconciliation efficiently. I recommend that Step 1 within D4 add “reconciliation of clinical information from multiple sources” to its list of prioritized workflows. Efforts currently under way in eHealth Exchange and Commonwell, as well as the IHE Reconciliation Profile, and other guidance should be considered. Up till now, disproportionate emphasis has been placed on “creating and sending” clinical summaries, but not nearly enough on the needs of the receiver of information, especially those who receive overlapping information from multiple sources. The same type of guidance is needed regardless of whether the payload is clinical documents like CCDA, FHIR resources, or other.

## Privacy and Security Protections for Health Information

My only comment here is that some of the ideas for verifiable identity and authentication of all participants can and should be applied to patients/consumers as well. After all, they are participants in the health care system, which should revolve around them. It seems that the current inability to accurately and unambiguously identify/match patient records across HIT systems is a major weakness that is only partially addressed in a different section of the Roadmap, the part about Individual Patient Data Matching on p. 90. In addition, privacy and security requirements for HIT should continue to be strengthened as opposed to the current trajectory where they seem to be delegated to other systems.

## Certification and Testing to Support Adoption and Optimization of Health IT Products and Services

* Page 75. It is good to recognize (e.g., “deem”) additional certification programs other than ONC’s, e.g., SureScripts e-Prescribing and others that overlap with the areas in ONC certification. When citing other certification programs, the Roadmap should also acknowledge **eHealth Exchange** and **the IHE and IWG** certifications. Any efforts to reduce redundancy and “hoops to jump through” are welcome, to reduce burden. It is good that the Roadmap says “well-coordinated so as not to create conflicting or duplicative requirements for industry stakeholders.”
* In addition to deeming, attestation should be considered as an option to testing in areas with very high variability. In the HITSC Implementation Certification and Testing WG, this was suggested for Lab, Immunizations, Syndromic Surveillance, and specialized Registries, where a large number of real-world interfaces to state agencies or other entities cannot use the ONC standards, because only the EHRs (but not the other trading partners) have adopted them. For such situations, attestation accompanied by a vendor’s listing of “live interfaces” should be acceptable, but should also require **transparency** regarding vendor fees to implement such interfaces. Interfaces included in certification should be assumed to be available “out of the box” (no additional fee) if implemented as is, and customers who see a list of implemented interfaces should not be misled into thinking that an interface done for a prior customer is automatically in the product if it is really an extra charge custom project.
* Page 76, I2 Certification Programs item #1. I agree with the concept of adding of more types of systems to HIT certification (e.g., LTPAC, Behavioral Health). However, ONC must be careful to make initial certification “lightweight” in new care settings, and leverage procedures and lessons learned from EHR certification. There is not the volume of systems and vendors to generate nearly as large a number of certifications as for the EHR Certification Program. So there may be a lack of business justification and “economies of scale” to bring ATLs and ACBs to the table (they would not want to spend more money creating testing and certification programs than they can receive in fees). For example, if a specialized market segment had only 40 vendors and those were divided among 4 ACBs, it would not be cost effective for each ACB to develop an extensive new certification program for only 10 customers!
* Page 76, also I2 Item #1, recommends a feedback loop from developers, ACBs, ATLs, and other stakeholders to ONC regarding gaps in certification criteria. It is good to have such a feedback loop. However, this should be made a separate item, as it should not be combined with the expansion of certification to new healthcare settings.
* **Additionally, the concept of a feedback loop to ONC for testing tools and the certification process in general is not mentioned, but definitely should be in the Roadmap.** ACB/ATLs could play a critical role in this loop, as they observe the real-world struggles and loopholes of systems going through testing and certification.
* On page 76, I2, item #5 “post implementation testing” could be useful if it means continuous availability of up-to-date tools to provide assurance on a voluntary basis and to help keep up with the pace of changes to standards (content standards, value sets, etc.). However, it could be **extremely** burdensome and infeasible from a business perspective if it means that testing/certification and/or surveillance is required for most or all systems as installed in provider sites (after local adaptations/customizations). Even identifying local adaptations would be difficult, as there would be new record keeping burdens: upon vendors and/or EHs and/or EPs depending on who made the adaptations. That could increase by one to three orders of magnitude the amount of testing, certification, reporting, and analysis that would have to be done by someone. Who would pay for this? Current EHR certification fees would be totally inadequate for ATLs and ACBs to do post-implementation testing. If it is voluntary and paid for by the parties wanting post-implementation testing (e.g., the provider who installed and adapted a vendor’s system), then it might be feasible. Mandatory post-implementation testing for every installation, or where things are working fine, would be a burdensome sledgehammer approach that should be avoided. However, the feedback loops mentioned above should be used to identify system problems (e.g., recurring complaints about particular certified products not being interoperable as claimed) and lead to remediation efforts.

## Core Technical Standards and Functions

* 77 – *“Standards for services”* description is too vague and limiting. Services in business do much besides “connect systems together” – e.g., shopping carts, payments, information, news feeds. In healthcare, they can similarly do many things besides “connect” e.g., directory services, clinical decision support, appropriateness screening, SMART apps, and others such as the exemplars in the recent recommendations of the HITSC APIs and Services Workgroup.
* 80-81 – **Consolidated Clinical Document Architecture (C-CDA)**  
  Many things can be done to improve the success of Consolidated CDA:
  + **Structured data consumption.** Variability in implementation of structured data is a general problem for consumption, but some areas should be addressed first. I recommend starting with consumption of problems, allergies, and medications.
  + **Guarantee human readability.** Variations in structured data should NOT prevent the end user from viewing the info in human-readable format! Failures in display indicate either invalid CDA processing by the receiver, or errors from the sender if they are not creating readable narrative. Testing should include more robust and unambiguous requirements for human display and the ability to accommodate variations. Currently, CDA is specific about displaying all narrative blocks, but is not precise on displaying the CDA header. The target success rate for human readability of CCDAs should be 100%. That’s the clinical fallback even if structured data consumption is not 100% successful: it is at least as good as reconciliation from patient “clipboard” input, which everyone is accustomed to without structure and coding.
  + **Improve usability of CCDA in the field.** The HL7 “Pertinent and Relevant” project specifically aims to address, through clinical stakeholder guidance, the problem that has been mentioned in several hearings and FACA meetings: excessively large autogenerated CCDA documents. I agree that this problem isn’t primarily with the standard itself but with how it’s implemented. For example, there should be practical guidance about what to send, and not send, in potentially voluminous data categories such as results, vital signs, and care providers. Hopefully the project will help EHRs and providers to produce pertinent, relevant, and usable documents instead. If ONC or the Standards Committee are already working on the same problem, on planning to work on it, I recommend that they collaborate with HL7 Structured Documents to avoid redundant or conflicting efforts. However, there may also be a need to discourage “autogeneration” in favor of encouraging more clinical judgment to be exercised by the document sender/creator. Guidance needs also to take into account and mitigate some reasons why too much information is being sent today:
    - Vendors or providers worried that filtering out some information *might* make them liable, so they default to sending too much rather than too little
    - Providers being too busy to take the time to tailor the information to the needs of the sender
    - Lack of education and awareness of how to select information
    - Deficiencies in some products, which passed certification but fail to provide usable workflows to select information
    - Taking the path of least resistance
  + **Improved Testing.** It is difficult to use certification to ensure that a system will send CCDAs without too much information. Test procedures generally define data that limit the test, and vendors can pass by strictly following the test data, but that doesn’t show what they would do with a real world patient who has lots of data that shouldn’t be included in a summary. Perhaps future test procedures should define LOTS of test data that must be present in the EHR, but which includes inactive data that should not appear in the transition of care document. EHRs that unselectively put all the data into a CCDA would not pass.
  + See also my comments on page 3 in response to the “Certification and Testing” question.
* 81-82 – *“stakeholders have also made it clear that there remains value in the documentation and exchange of some unstructured data…”* Yes, I totally agree! The valueof unstructured data should **always** be acknowledged, just as there will always be value in **people communicating via human language** rather than codes and multiple choice answers. It should not be considered a temporary concession that will go away. It’s unnecessary and counterproductive to try to overstructure things. The appropriateness of structure varies by type of data. For a list of meds, yes we need structured RxNorm codes and consistent valuing of discrete attributes such as dose. For some categories of information, such as Behavioral Health, it may eventually be structured, but we shouldn’t let the lack of agreed-upon structure hinder the free flow of unstructured information now. Information from a patient interview is originally unstructured, and should be preserved and shared as it was expressed. See also my earlier comments on the Executive Summary, RECOGNIZE THE CLINICAL VALUE OF HUMAN LANGUAGE (NARRATIVE).
* Page 90 – **INDIVIDUAL DATA MATCHING.** In addition to mentioning voluntary additional attributes, there should at least be a mention of a voluntary patient identifier. With all the concern about privacy and patient engagement, why not allow patients to “opt in” if they are in favor of a method that would provide exact matching? To those in other nations who have solved the problem, the USA looks backward. Why not PILOT use of a voluntary ID? Even if only 25% of patients are willing to opt in to such a pilot, that could be thousands or millions or records (enough to be statistically significant), and can test for fragmentation, false positives, false negatives, and percent of time those patients are unambiguously found in searches. Such a voluntary unique ID could be a new element or an existing information such as driver’s license #, email address or other item that patient chooses to use consistently. While restrictive regulations on patient ID exist from years ago, every regulation can be amended. What would “John Smith” or “Jose Rodriguez” say about his inability to do anything to improve the accuracy of matching his records? Use of a voluntary ID would even help those who opt OUT, because it would remove the “good matches” population from the pool of uncertain matches, lowering the number of potential mismatches among the rest. It seems ironic that there are standards for unique identifiers for devices (UDI), providers (NPI), documents (OIDs) and even ids for individual items within documents, but not even an optional ID for patients.
  + I support item #3 on page 95 and #7 on page 94, identification and testing of additional voluntary data elements. I doubt that a minimum required set alone would improve the situation enough beyond current state. I agree that there should be better standards to format specific elements -- such as apostrophes in names or dashes in numbers -- or guidance to strip them out in search logic. I also recommend a list and standard formats for “voluntary” / “optional” elements, such as email address, last four of SSN, drivers license, all of which are used by some today. These could refine searches and be used in compliance with patient preferences and organizational policy. Those that are prohibited from using, or do not want to use those elements, could ignore them. But those that can benefit would not be hindered from using them for more accurate matching. I recommend that the Roadmap propose both the minimum required set as well as voluntary standardized elements based on best practices. The list of elements that should be supported would be larger than the list of elements than are required in every query.
  + The Roadmap should also encourage exploration of patient matching **processes** rather than standardizing data elements only. Involving the patient in the process (as done by Commonwell) can be a major factor to improve accuracy. Similarly, ONC or private industry should examine best practices and problems with registration processes, such as data entry errors or registrars entering duplicate registration without even trying to match. Humans make a difference! We can’t rely on machines to solve the problem entirely.
* 96-97 – Despite some FACA’s negative comments re proceeding with the Healthcare Provider Directory (HPD+) standard, I recommend gathering more facts about its level of adoption among state HIEs, eHealth Exchange, etc. Its use of SOAP should not in itself not be reason to disqualify it. Many vendors and HIEs collaborated to refine the standard and their efforts should not be dismissed offhand.

# Tracking Progress and Measuring Success

* 102. The proposed framework for measure progress in 3 domains (adoption of capability to exchange; info flow and usage; impacts on healthcare outcomes) is good! It is important, though, that the measurements be a byproduct of normal EHR workflow and use, and avoid imposing burdensome “check the box” questions on users.
* 105-106. Figures 11 and 12 give some good example measures in each stage. However, there should be more measures from the perspective of the information consumer (receiver of a push, queryer of a pull), not just from the perspective of the creator/sender/source of data. I recommend that a baseline be established in selected sites, and tracked so that the evidence of progress (or lack thereof) is based on statistics with continuity over time, and not just anecdotal.
* 108. Rather than speaking generically of outcomes, the Roadmap can and should focus on a **few** top priority outcomes that should be targeted. It should use some real exemplars that can be impacted positively by EHRs that proactively promote quality, e.g.,
  + potentially preventable readmissions for congestive heart failure, pneumonia, renal failure, bipolar),
  + unnecessary/duplicate tests such as lab or imaging for the top few conditions like stroke, diabetes
  + adoption measures that don’t settle for “having” CEHRT but rather “using” specific features like Transitions of Care. This is hinted at in footnotes on 108
* 109. Measurement, while essential, has been a source of complaint for both providers and developers for different reasons. Going forward, candidate measures should be examined for other factors in addition to clinical value, e.g., impact on user workflow, intrusiveness, time required (preferably zero for users), and ability to reuse data routinely collected in clinical care rather than requiring additional questions..

# Appendices

## Appendix H

* ***“Please submit 3 priority use cases from this list*** *that should inform priorities for the development of technical standards, policies and implementation specifications.”*   
  While I agree it is good to focus, limiting to 3 is too limiting. Many of the use cases listed are duplicative or overlapping. (e.g.,
  + Transitions/Coordination of Care – Use Cases 3, 4, 9, 12, 29, 33, 39, 40, 41, 42, 49
  + Patient-Generated Health Data including patient input to care team – Use Cases 13, 14, 19, 20, 21, 37, 48, 52, 56
  + Patient use of data themselves – Use Cases 7, 17, 18, 20, 28, 35, 41
  + I suggest that the use cases be combined into a smaller number. I commend the work of the HITPC Advanced Health Models WG, which is consolidating, reducing fragmentation/overlaps and prioritizing based on a systematic methodology based on factors such as the National Quality Strategy and industry readiness. I believe that their methodology is consistent with the approach recommended by the Standards and Interoperability Task Force for assessing “what must be true of an identified national priority.”