Standards in Action: Interoperability Priorities Questionnaire

133 responses were received between 30th October and 7th November 2018. Background and introduction provided by recorded WebEx. YouTube video. Presentation.
Minor modifications to answers have been made to de-identify individuals if explicitly requested, or to amend typos/shortenings

What is your organisation type?

Number of responses = 133

Academic Institutions, Professional Bodies, Other networks, N=15, 11.3%

Arm's Length Bodies (NHS England, NHS Digital, NHS Improvement, Public Health England), N=28, 21.1%

Care providers (public & private), N=35, 26.3%

Care Organisations (CCG, CSU, LHCRE, STP, LDR, ACS), N=13, 9.8%

Software Suppliers, N=42, 31.6%
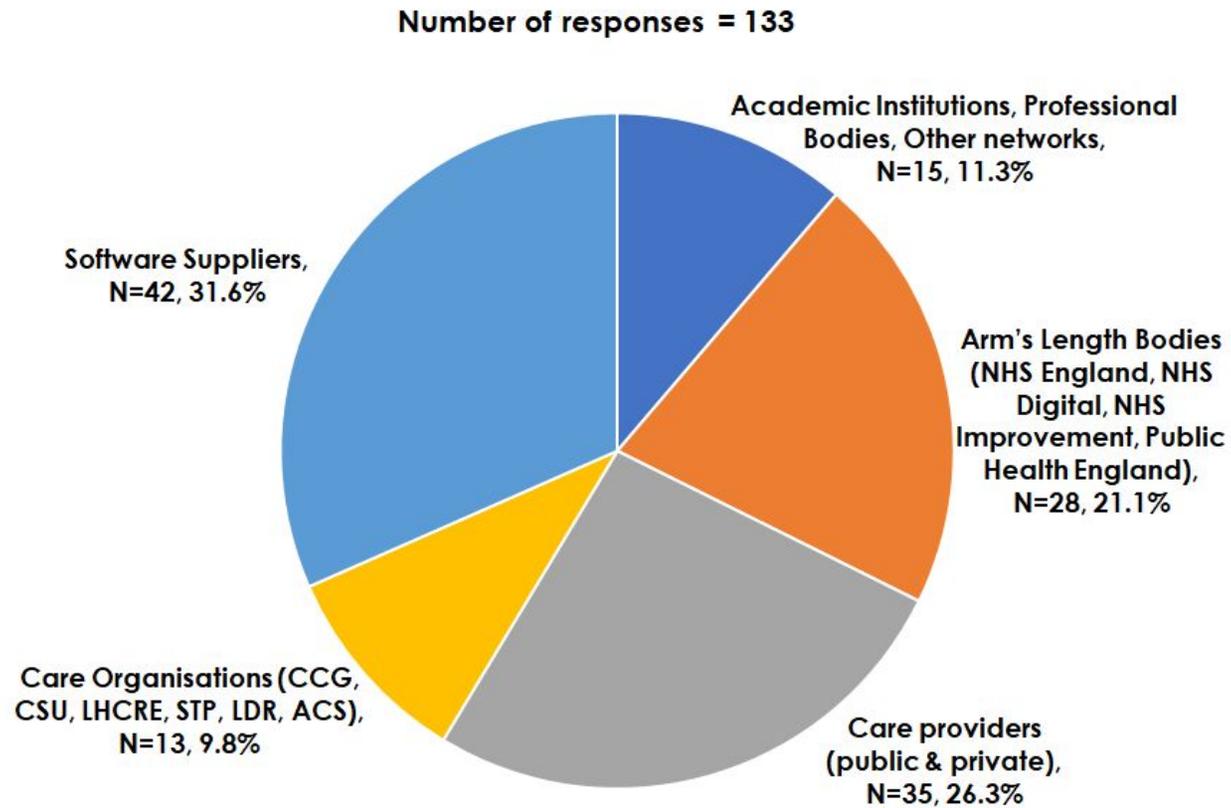
Is your organisation a member of INTEROPen?

Number of responses = 133

Not sure,
N=28, 21.1%

No,
N=22, 16.5%

Yes,
N=83, 62.4%
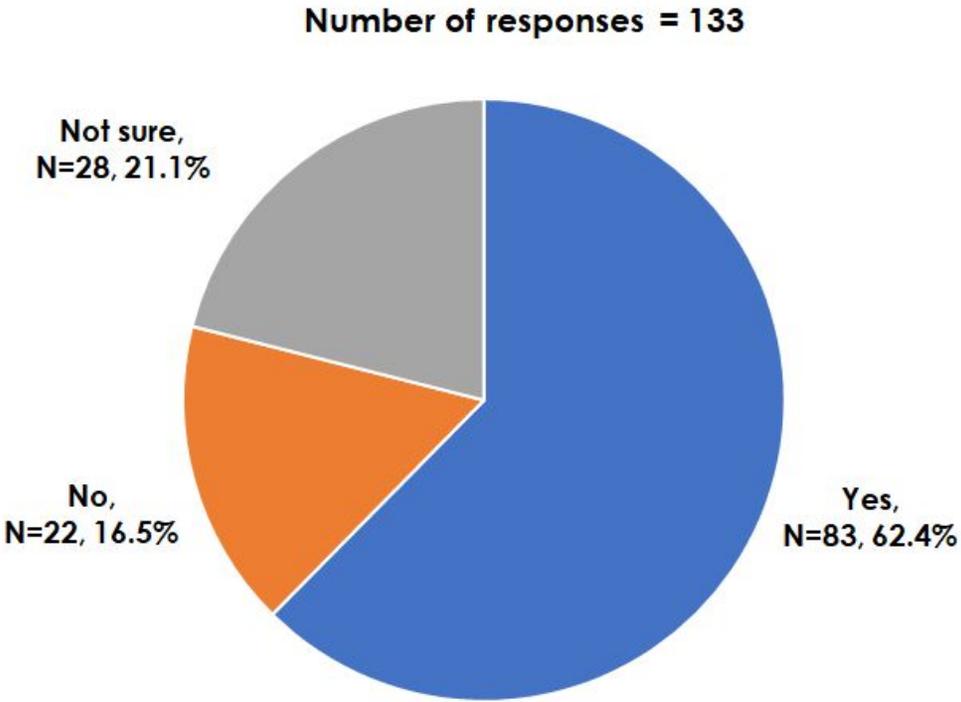
Distribution of priority scores for components relating to Care Processes and Handovers, from Very High to Very Low (133 responses)
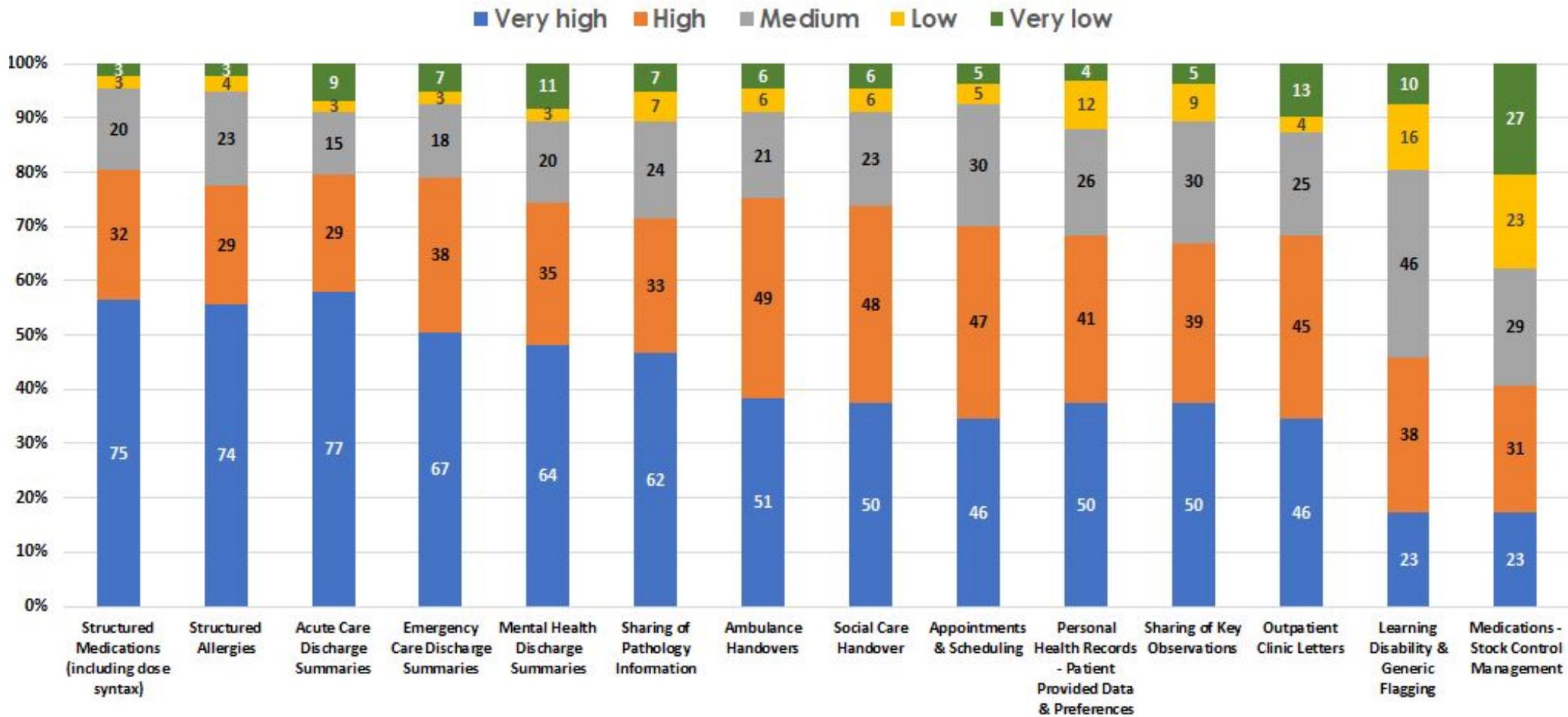
Interoperability care process and handover components displayed from left to right, in order of decreasing total priority score.

Distribution of priority scores for components relating to Foundation and Care Records, from Very High to Very Low (133 responses)
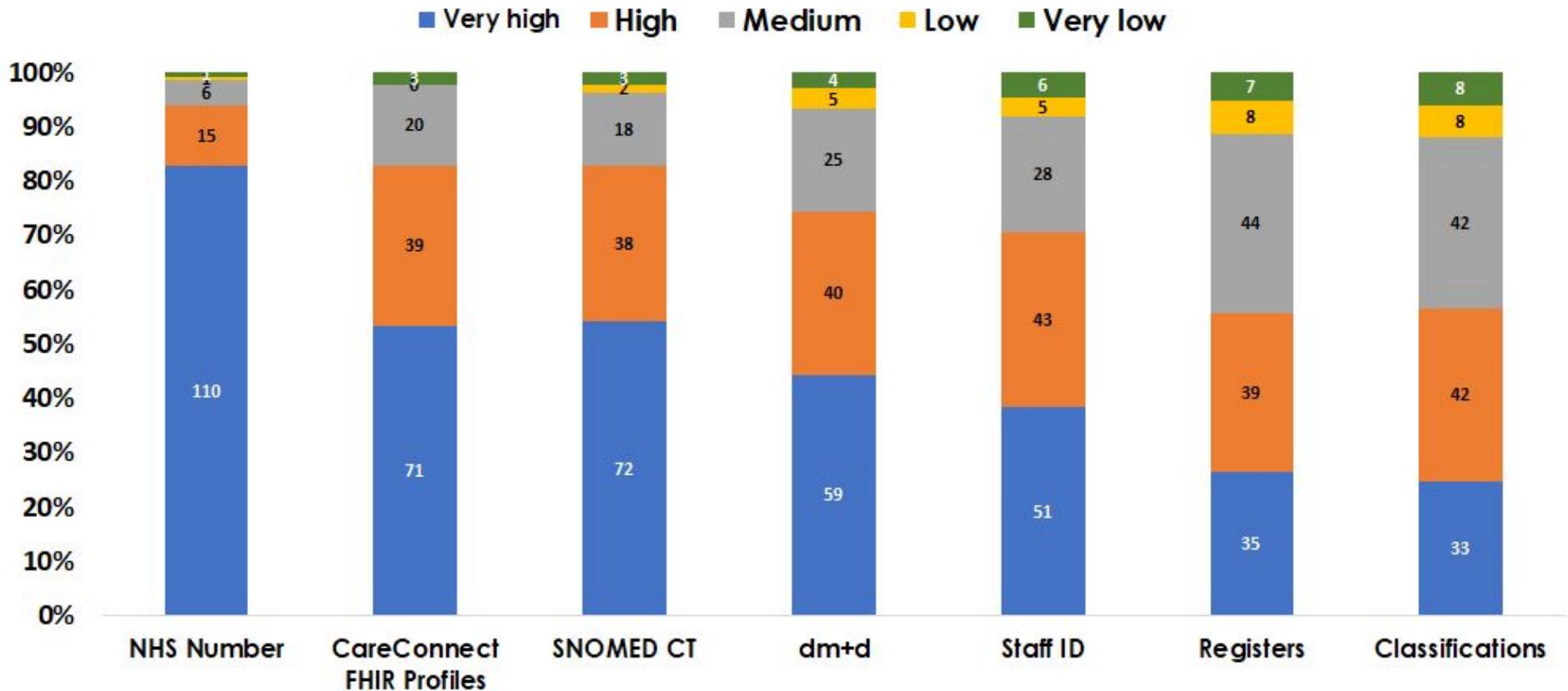
Interoperability foundation and care record components are displayed from left to right, in order of decreasing total priority score.

Distribution of total interoperability priority scores allocated to Care Processes and Handover components (133 responses)
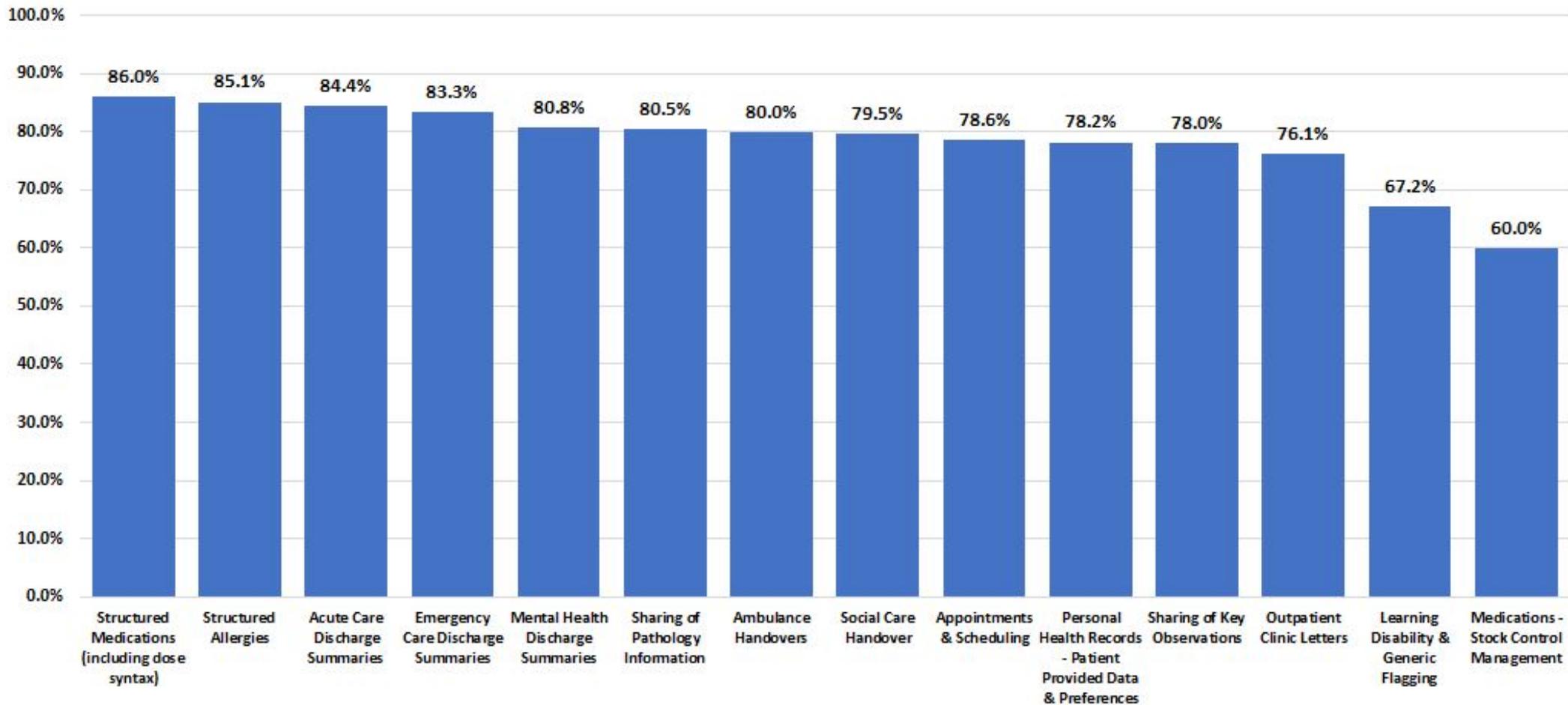
Each bar represents the total priority score as a percentage of the maximum possible score. Using the likert scaling, the maximum possible score was 655 (133 respondents* 5; Very Low = 1, Low = 2, Medium =3, High = 4, Very high = 5). The bars are displayed from left to right in order of decreasing total priority score.

Distribution of total interoperability priority scores for Foundation and Care Record components (133 responses)
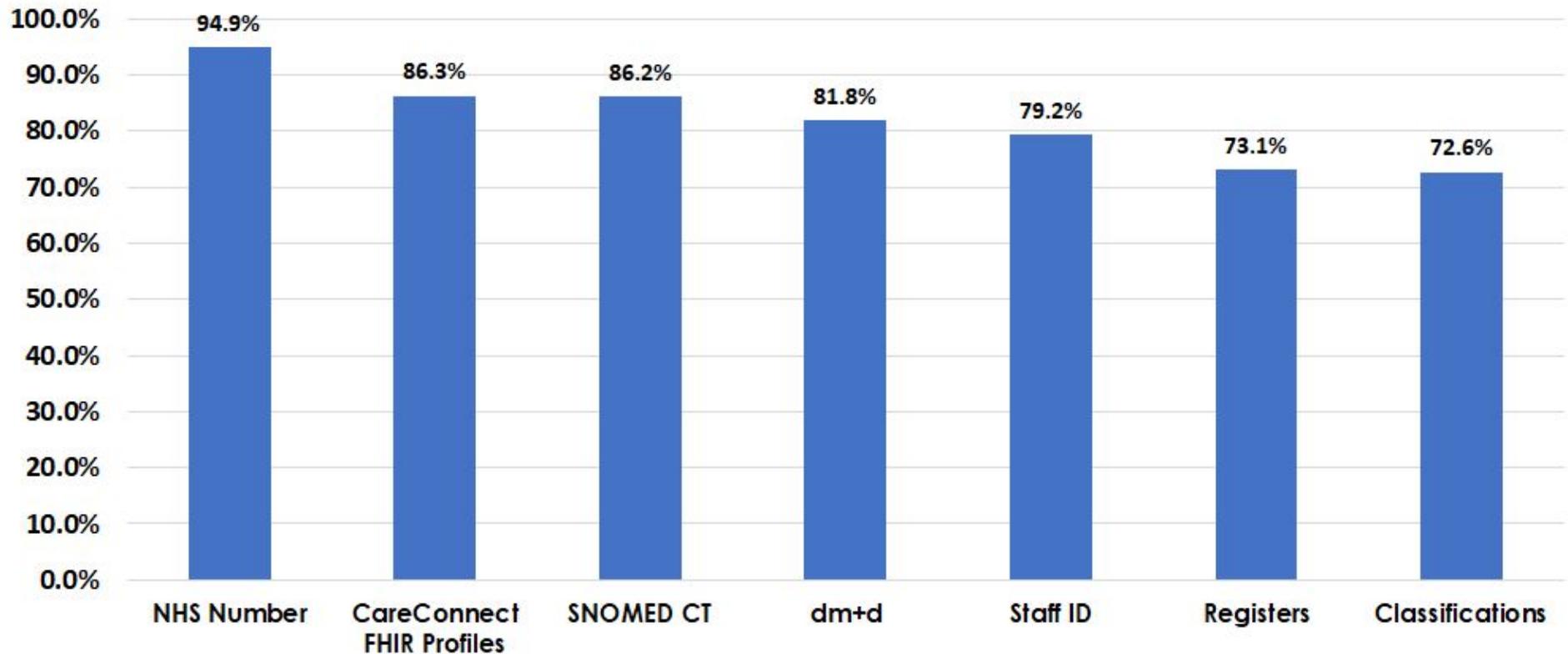
Each bar represents the total priority score as a percentage of the maximum possible score. Using the likert scaling, the maximum possible score was 655 (133 respondents* 5; Very Low = 1, Low = 2, Medium =3, High = 4, Very high = 5). The bars are displayed from left to right in order of decreasing total priority score.

Questions 1. and 1.1:

1. Are there any other interoperability components which you believe to be of high priority?
1.1. Please note why these are important to you/the service:
(responses to question 1.1 are indented where provided)

- Condition care plans - e.g. asthma action plan, diabetes in school plan
    - Multiple digital versions without a current standard. Easy to implement rapid change with limited number of data fields. Asthma, diabetes, epilepsy all have paper standard, but not digital. We are trying enable data sharing between patients, local authorities (school nurses, teachers) and NHS stakeholders. There are already digital asthma plans on EMIS, Cerner, etc. but no common coding.

- Ability to send electronic discharge summaries (medications) to community pharmacies and care homes as well as GPs.
    - To reduce patient harm and hospital readmissions through timely meds reconciliation

- Sharing of social care records into health organisations
    - There is very little structure and consistency among case management systems - a common information model and interfacing approach should be agreed that all suppliers can implement

- Not seeing any obvious components supporting Care Plans or Care Pathways in the 'Care Processes' section, e.g. what does a generic, interoperable, exchangeable Care Plan profile/template look like?
    - These underpin the majority/all the Coordination & Pathway items at the next level up.

- Other HL7 messaging other than FHIR, specialised ontologies for genomics
    - While FHIR is developing fast much standard integration work is satisfactory using HL7 version 2. Rare disease identification may benefit from use of additional Ontologies

- Apps commissioned in your area for the local approach to navigating the level of apps that are emerging in the local health and social care space.
  - The system is not clear what is available and this is leading to duplication and unnecessary expenditure. It is essential to have the digital landscape navigated in a clear and consistent manner both for the workforce, service leads and service users. This can provide a sense check on what we already provide before recreating the wheel.

- N.B.: Items I've ranked lower in survey are due to us already having the functionality live, so might be a bit selfish perspective. Every provider in the UK who prescribe to patients should have systems capable of integrating with the national EPS function.
  - From a safety/efficiency process, all functions around prescribing should be closed loop and electronic. Aging population and language barriers means this should be system-to-system messaging.

- Messaging INTO secondary care from Primary Care & between secondary providers - including Conversational threads. That, and referrals.
  - Because a lot of the conversation is about flows to GP. Yes, structure is nice -- it finishes the job, but eligibility and timeliness is 90% of the job. We did that over a decade ago - but still only have this ONE way. A GP and Hospital consultant cannot have a discussion as part of a record -- they can't communicate to the hospital, other than via eRS - which is no use & lost to the patient record. It's an admin system.

- LOINC
  - LOINC and SNOMED CT are complimentary terminology standards. In general LOINC is used to represent the observation being collected, and SNOMED CT for the observation value. My personal view is that SNOMED CT has been available in the UK for at least a decade, without many successful implementations, and as such there are parallels with HL7 v3. If it's difficult to implement, let's find something that is easier to implement, is my view on this, or atleast have a plan B if SNOMED proves too difficult to implement.

- Common clinical information models
  - Reuse and semantic interoperability

- Classification/value-sets of document types. Documents are still a key form of how clinicians share critical clinical content. Unfortunately, because documents do not have consistently agreed metadata of the service and speciality types, an unnecessary amount of admin time is spent classifying it on receipt which can itself be prone to errors. In addition, if the classification is not done, or wrong, unnecessary amounts of clinician time are spent looking for the right document. Nationally agreed data sets will help to search more easily for the appropriate clinical documents e.g. diabetes outpatient appointment, endocrinology, etc. The NHS contract should mandate a national document type

standard approved through clinician engagement via the PRSB and its associated clinical stakeholders. The agreement of care planning and EoL data sets as part of a document structure is also key to improving the effectiveness of care delivery for an ageing and multi-comorbid population especially outside of general practice activity.

- As a GP I spend a lot of time trying to find the necessary information written inside key documents. The process of finding them should be easier, supported by structured coded content, backed by a standard set of metadata that allows fast searches. This would boost my confidence that I can find the necessary encounter/clinics and data in question that I need. In addition, as patients are encouraged and enabled by digital access to become more engaged, they will probably need "summary" contents of clinical information to help them as filters. Care plan and EoL documents will contain such information: describing self care and also expectations of how others will care for patients. The patient is the key untapped partner to save the NHS.

- Metadata registers and catalogues
  - Before integration can happen you need to know what you have, where it is, what format it is in and what it means

- The ability of the clinical system to present the patient with a structured questionnaire in the PHR and return the responses as structured data
  - This would enable structured pre-consultation planning for long term conditions, e.g. diabetes

- Structured discharge summaries.
  Structured pathology/meds

- Standard citizen identity, for both authentication and authorization
  - In order to be able to offer a simple, universal offer to all patients across the UK

- Ambulance Request messages need further detailed elements that relate specifically to Ambulance Trusts. For example, the use of a standard vocabulary list for NOC (Nature of Call) reasons and an element within the message to hold this value and text.
  - The NOC is now gathered by all Ambulance Trusts upfront and where inter-transfer of data is required, this element is fairly critical to the type of resource needed to be dispatched to a call.

- Cross-system authorisation
  - To support effective interop between a large number of system combinations within urgent & emergency care

- Access to health care records electronically.

- ○ Remove paper letters. Save money and some trees. At least make it a preference setting for patients who want to access outpatients and referrals letters online.

- Authentication and authorisation services, including if both national and local, how these will work in parallel
  - ○ Data sharing must be trusted from authenticated systems and users who have been authorised to share such data.

- DNACPR / Respect care plan EOL
  - ○ Avoiding admissions, improved patient care.

- Real-time bed occupancy within hospitals and community (as in capacity for virtual ward rounds in community)
  - ○ To manage demand better and seamlessly and in real-time, and to enable remote monitoring of patients allowing "moving care towards community" as per "5YFV/STP/ICS" integration agenda and reducing Hospital admissions.

- Access to structured data from GP systems
  - ○ Constant blocker on the pace of innovation projects

- The implementation of IHE XDR for pushed (unsolicited) messaging across different care settings and healthcare organizations. Similarly, the adoption of IHE XCA for query and retrieve (solicited) interoperability.
  - ○ IHE is an international standard that's used to extend care outside of a single organization. Because it's been adopted in other countries, support across software suppliers is more likely, and could more readily improve adoption across healthcare providers.
  - ○ Adopting these IHE standards (as opposed to developing custom, UK-specific strategies) will provide the highest potential for enabling interoperability internationally.

- IDMP and UDI
  - ○ Enabling links between medicines regulatory networks, HTAs, and HCPs. Plus availability for signal detection and future research.

- No, that's enough

- Better options for sending structured data from patients into the document manager / workflow modules of GPSoC systems
  - ○ It's a key part of our service

- Citizen ID (NHS Login) including Proxy access

- - Single identity for citizens.

- Sharing tasks
  - Tasks are a far more effective way of disparate parts of the health service communicating with each other.

- Patient Flow - this has not been clearly defined or discussed. I think it's imperative to support quicker discharges that require Bed Management processes e.g. nurse led actions/task, bed identification
  - Support shorter bed admissions

- The ability to send/receive a generic 'clinical correspondence' document that can be used when the specific use cases do not apply is something that keeps getting requested by users.
  - Allow users to meet paperless objectives

- Medicines reconciliation
  - Workflow

- Transition from children's services into adult and social care services
  - A very high percentage of children are lost during transition and then have reduced health outcomes; or arrive in a poor state and require significant intervention to recover

- Not just Pathology but all the other 'investigation' domains including screening services. Child health Vaccination and Immunisation data and the ability to exchange child V&I schedules between GP Practices and Child Health departments (which is still on 132 column paper!!)
  - I've worked in these areas for 30 years and they are still on paper! They are also high volume transactions - and relatively discrete datasets so easy to do!

- I think we need to address the issue of how information is recorded on disparate systems in different information/data models. We need to define professionally owned models and agreed metadata which attaches to the data. Then all this can be interchanged much more readily. We can build FHIR resources to share BP, but if we haven't agreed a model (Archetype?) for that, then we don't really know what it means when it appears somewhere else. Similarly with Diagnoses, where they are used quite differently in primary care and secondary care. So I thInk there is a step before the interoperability which we are in danger of ignoring.
  - Self explanatory

- End of Life/Urgent Care Plans
  - Having ubiquitously available preferred places of treatment and preferred place of death plus advanced directives and ceilings of treatment not only is much better for patients and their families but also saves the NHS vast amounts of money. See how Co-ordinate My Care in London saves £2,100 our patient with one of the Care Plans

- Data links between clinical data and the medicine supply chain (GTINs)
  - This would enable clinical pharmacists to provide an integrated medicines optimisation service

- The ability to see what the future care plan is for the patient i.e. who is going to do what, ideally with timelines e.g. Outpatient echocardiogram within 6 weeks, cardiology outpatient appointment within 6 weeks after echocardiogram
  - To be able to plan a patient's care, especially a patient with complex needs

- Not exactly 'interoperability components' but LEADERSHIP & CULTURE are critical high priority elements. The interoperability success some geographies, some organisations & some professional groups have achieved has been because the leadership have created a culture to drive success. Delivering technical standards capability needs to be accompanied by a concerted focus on creating the right environment for it to flourish.
  - Because it simply does not become a reality without them :-)

- Prescriber identification, Medicines Administration codes
  - Tracking responsibility, patient safety

- Not just Path but ALL Tests, Investigations and Observations e.g. FBC, TFT, CXR, ECG, Weight, Frailty-Score.
  Also Hospital (Secondary Care) and Community Prescribed data.
  - Reduces duplications, accurate Decision Support and better completed algorithms

- Sharing of physical health screening results such as the Lester Tool between primary care and mental health
  - To reduce the preventable high mortality of people with severe mental illness

- I believe that a generic ability to be able to share document regardless of content is a high priority. This can be a generic way of handling documents, structured or otherwise. Whilst we are debating the content a discharge why can't we just create the pipes and channels first.

- As a doctor, if I can get access to documents pertinent to a patient, I can pretty much treat them. Document brings context the way that an individual blood result, BP measurement or list of medications only does not.

- Patient Preferences inc consent; acknowledgement of action/ownership
  - Consent = share for trials/research; acknowledgement = closed loop safety

- Internal interoperability between multiple systems within an organisation
  - Integration of systems within an organisation is a priority over external interoperability

- End to end delivery of Care Connect using the foundations described as well as calling mechanisms, security and assurance.
  - This gets interoperability delivered in care settings

- Thank you for an obviously non GP based questionnaire. We are way ahead of this game already hence my universal low priority scoring.
  - What GPs need is not stuff "sent" to us but EDI'd to us. We already have documents sent to us from OPD, A&E, NHS 111 etc., some of which are EDI, some not. We want them to arrive, to transfer structured coded data automatically and then sit there in a workflow for a clinician to look at.

- How can we ensure mental health services and their needs are well represented within Interoperability priorities?
  - Working with IAPT services gives us good insight into their challenges and we would like to work more with INTEROPen and partners on how Interoperability can support this sector

- No

- This kid covers most of them. Issue is several are needed to form an mvp

- Audit data, GDPR compliancy

- eRS APIs
  - We are having to undertake full eRS accreditation to achieve aspects required by commissioners which are not yet available via the APIs - such as alerts

- Alerts regarding the patient (over & above allergies). Vital signs & pathology "normal" levels for the patient

- ○ Alerts regarding behaviors or environments are critical to joined-up care of MH patients between health & social care providers. Identifying "normal" ranges for patients will aid identifying where interventions are not required or standard diagnosis is not appropriate.

- No

- The ability to identify each and every encounter with health and social care services in real-time. The details of which can be revealed if required.
  - ○ There is a known clinical risk when patients are accessing mu services

- Register of consent for all clinical bodies (e.g. surgery) involved in a Service user (by NHS number), with a corresponding linkage to the "clinical bodies staff currently working".
  - ○ So that a GP Surgery can send locum doctors to record care details and see care information of residents in care homes that the surgery is responsible for. Same issue for most outpatient clinics.

- Citizen identity; Task requests

- Audit tracking (not just Audit within participating applications, but Audit like the IHE model using the ATNA).
  - ○ It means the audit tracking can be centralised (in LHCREs, for example) and that when you change suppliers, you don't lose the audit trail. It is also a useful place to be able to mine information.

- Authorization standards (OAuth) and Single Sign On
  - ○ Giving patients power to authorize of sharing data, SSO allows for access to more data sets without more involved sign on processes.

- No
  - ○ Not applicable

- 1. Cyber-Security - Better definition of the standards and practices that need to be adopted to ensure the information being exchanged and stored is done so in a secure way that minimise risk for people who have opted to share their information.
  2. Privacy - Better definition around the management of peoples consent and their preferences to share their data (including clarification on alignment with GDPR)

3. Security - Better definition of the authentication and authorisation standards that support an ecosystem of patient and provider based apps across local, regional and national systems.

4. De-ID/Re-ID - Better definition and guidance on the standards and services that should be used to de-identify, re-identify and re-tokenise data

- At the core of interoperability is people's information. Ensuring this is processed and used in a secure way that aligns with the preferences of the person is key to enable adoption of patient based digital services in the NHS

- 1/Sharing integrated care and support plans with patient and between care providers.
  2/Structure for a person-centred care record which is common across care settings
  3/Standards for recording alcohol and tobacco use
  4/Standards for recording clinical incidents and near misses in the EPR
  5/Document metadata standards
  6/Common audit data sets, with set of diagnostic and procedure codes for each clinical audit
  - 1/ Improve integration and coordination of patient care around goals of the patient.
  - 2/ Support for self care and patient access to records
  - 3/ Important phenotypic data, supports prevention agenda, NHS England CQUIN.
  - 4/ Improve transparency, learning culture, reduce incidents
  - 5/ Sharing of documents in LHCREs
  - 6/ Remove burden on clinicians of separate clinical audit data entry (data recorded in EPR and extracted for audits)

- Non Repudiation
  - Governance

- Platform architecture & moving from systems to shared open standards federated CDRs; OpenEHR
  - Promotion of innovation, standardisation without stifling new processes, risk reduction; need to spin things up rapidly and consistently; management of the change process; maintenance of patient & staff involvement

- Organisation Reference Data
  - Organisation codes and data underpin many of the processes listed in the questionnaire and is key to interoperability

- OpenEHR archetypes for standard data e.g. medications, adverse reactions, smoking, alcohol, family history, weight.
Service directory (not all UK has ODS).
Record Locator Service (not all UK has RLS).
    - These core re-usable datasets are present in nearly every clinical app. but until clinically standardised are not meshable between systems, and create a conversion and maintenance burden on each supplier that NHS must stop paying for.

- Care plans and versions
    - Being able to see all the asthma / diabetes care plans for a patient and which is the latest will help a patients journey through the system.

- Safeguarding & pupil number
    - These are very important across all services as they determine who information can be released to and what safety measures need to be applied to protect the individual.
    - Pupil number link to NHS number is vital to measure long-term outcomes for children that link with achievements - vital to determine effectiveness of many interventions.

- You have covered them well
    - The priorities you have highlighted are the key areas that clinical staff refer to regularly.

- The main components are covered in the questions we responded to.

- Sharing of documents, diagnostic images and test results
    - They are not important to a particular service but a common request on all services.

- It isn't a component as such but I think we need to have some clear guidance around data sharing between organisations and with patients. A set of standard DPIA and IG use cases that can be re-used would help avoid repeating the same conversations and I think would boost creativity too within the allowed bounds.

- Flags about conditions and the related care plans (where applicable)
    - Healthcare Professionals who provide remote Urgent and Emergency Care (Integrated Urgent Care through 111 and 999 telephony) have indicated that knowing about long standing conditions and having access to carer details and care plans would improve

efficiency when supporting patients who present with multiple complaints and or complex care needs.

- Inbound Referrals, Consent (information governance)
  - both are missing in the overall landscape. Referrals are effectively Transfer of Care but into the acute service. Consent is key for cross organisational work.

- Ideally alongside staff ID we need to start thinking about the 'metadata' associated with staff such as role, grade, competencies, specialty, service etc.
  - At the moment between EPR systems, ESR, E-rostering and potentially additional workforce solutions in the future there are significant differences in terminology and definitions for that metadata. If we don't resolve that we will struggle to understand our collective inputs and their relationship to outputs and outcomes

- The earlier questions covered all of the important areas to be getting on with for now. No doubt others will appear as we progress

- Making sure all of the elements of a patient record, such as those identified and associated with PRSB standards such as the Healthy Child Record and Maternity Record are modelled and able to be shared across all settings that want to interoperate
  - I think it's important that all sections of a patient record are modelled to allow interoperability across all care settings. I believe this is more important than creating standards which simply digitise current paper processes

- XDS registries
  - generic document management across hubs

- No

- Expressing methods preference of communication with patient.
  Ability for pulling carer information to platform
  I think the descriptors of document type need to be reduced to their commonalities.
  Need to not boil the ocean.
  Some of this could be delivered more quickly than others.
  If this to be a long overdue requirement for GDE providers then great. I don't know of the contractual levers
  - Same

- FHIR standards approved by NHS England / NHS Digital
  - Mental Health and community services need to gain parity to acute technology

- NRLS support for locating citizen provided data
  - As more apps are used by care providers, need to (a) understand where citizen generated data is located and (b) be able to get it out of the app and into the health and care professional domain easily and without supplier barriers

- Context launching between systems
  - saving clinical time

- The development and implementation (over time) of a common EHR data holding format.
  - Moving to such a scheme would provide maximum data sharing ability and hugely reduced cost across the NHS. It would leave suppliers free to innovate the USE and presentation of the data rather than constantly inventing and reinventing ways to share data - activities which currently consume enormous amounts of resource and money.

- Capacity sharing. The ability to publish your available capacity in a given area so that resource utilisation can be managed on a regional basis.
  - This will enable more efficient use of resources across a given area. A patient can be given the option of traveling further for a quicker appointment. In diagnostic reporting, images could be moved to areas with the most capacity. Currently workload can be shared, but it is difficult for a Trust using System A to know what capacity is available in another Trust using system B.

- Interoperability should be about how we blend together the standards across multiple dimensions, it should not be about the information or the care processes or the technology but its about identifying and agreeing the right care standards or information standards in the appropriate context to inform the technology solution.
  - Most people in provider organizations don't understand why interoperability is so important, they want to buy a technical solution that fixes it without investing in the foundational standards that glue it all together.

- NHS Identity Service
  Citizen Identity Programme
  NHS Record Locator Service
  CDS Hooks

- Adoption of Authentication and Authorisation standards including SMART on FHIR OAuth2 profiles are key to supporting mobile access and context management between apps.
- Need consistent ways for users to access our population health and other platforms, we federated IdM and need to consume from existing IdM services but the local market has not solved these things
- NRLS or LHCR looks-ups are important for missing information on Citizens that is not in region.
- CDS Hooks so we can get actions and recommendations to invoke workflow in third party EPR and other applications.

Questions 2 & 3:
2. Of the priority components which you consider to be high priority, please let us know your suggested order for delivery and any critical co-dependencies.

3: Do you foresee any challenges to implementing the above and note any suggestions for how we may collectively overcome these.
(responses to question 2 are indented where provided)

- Consent to share preferences by patient
    - Would be nice to have a national campaign rather than localised

- NHS Number as master patient index and HL7 v2 integration.

- NHS number, discharges across settings / types

- Do small things well, don't boil the ocean
    - Keeping it simple. Note SNOMED CT 20-odd years because not simple

- Foundation and Care Records

- With so many local and national priorities, not just interoperability I cannot answer this, especially as there is no extra funding for these - well not that has come to us yet. All system suppliers have given us very little information on their timescales, but happy to provide a quote. Internally we are not a exemplar site, we do not have an EPR, EPMA, and the list goes on, so how can we deliver all this rich information when we do not capture it yet?
    - Yes, massively. Lack of investment in IT, and very little National driver to system suppliers to cooperate with it all. We have used FHIR to share social care information to staff in EAU, which went live in May 2018. This was to remove the paper-based referral process to social care for supported hospital discharges. As the count council did not use HL7 this was an easy choice.

- Personal Health Records - Patient Provided Data & Preferences

- National implementation and use of SNOMED. Implementation of data analytics using SNOMED descriptive knowledge and architecture of systems that goes beyond the use of SNOMED as a long list of codes
  - Implementing enterprise health IT systems is costly and challenging. This needs emphasis as making headway needs to be a mix of single system implementations with a push to expose APIs and allow inbound messages.

- Not sure
- Coded discharge summaries to GPs and pharmacies. Co-dependencies will therefore include use of SNOMED and dm+d and also FHIR to enable this to occur. Connecting diverse clinical systems that need to 'interact' particularly in hospitals.
  - Feedback I have had in my role is that there is lack of specific requirements that steer system suppliers in delivering a solution (e.g. what are the specific coded elements required in a discharge summary - VTM or VMP or both?). They are requesting this information now.

- SNOMED CT

- There needs to be much more homework on the foundations for standards, and more work working on the agreements that will underpin the outputs
  - The real proof will be in delivering PHRs that are health literacy enabled, the conversation with the public, the governance of federation and the realistic resourcing of standards support all need more time and energy.

- Medications across all Care settings including secondary care- linked to allergies and then Transfer of Care details
  - A unified approach across all change programmes - so that plans are aligned . Using specialised implementation teams who can take the learning and share during broader rollout across change teams

- Ordered 1-4
  - 1. Cyber-security - Retro-fitting cyber security controls into existing/legacy systems is difficult. Enforcing this is harder. Mandating alignment with for example, NCSC principles will help. Will need support from NHS England.
  - 2. Privacy - Retro-fitting consent into an eco-system of existing solutions which have an existing investment in an alternative approach will be difficult and costly. Clarifying how consent is stored/managed across an eco-system of national, regional and local

systems is also important. Providing a single place for patients to manage this will be key. Defining interoperability with this registry will then enable adoption.
- 3. Security - As above - retro fitting authorisation profiles across existing systems can be difficult. Agreeing a profile that works for patient apps and a wide range of roles for provider apps will be difficult. Using existing standards will help but shaping these to the needs of national, regional and local systems will help ensure adoption.

Some other quick challenges re the questions on the previous form:
- 1. Transfer of Care for inpatient/mental health/outpatient discharges - alignment of this across care settings and suppliers will be hard. E.g a supplier for secondary care implements the necessary CareConnect profiles for discharge but a supplier from primary care does not support receiving these. How can this this transition be supported to ensure the standard is adopted quickly and everyone does not stop after declaring they have a plan to adopt ITK3.
- 2. The funding question comes back a-lot when talking about implementing new interop standards. I realise this is not the responsibility of the InterOpen but is there any clarity that they can help provide E.g. what support is there for NHS organisation to adopt transfer of care or more broadly the CareConnect APIs. If there is any clarity or guidance that can be provided here it will help a lot.
- 3. FHIR Versioning - CareConnect is based on a specific version of FHIR. FHIR is still actively being developed so further clarify on how InterOpen plan to manage this evolution of the standard would be good to see.

- The sharing of sensitive information from the GP to the woman's named midwife in the antenatal period is fundamental to ensuring safe care, especially if the woman has previous mental health issues. Also the handover or transfer of care of post-natal women from community based midwifery care to Health Visitors and GPs is critical to ensuring vulnerable women have their additional needs met. The lack of interoperability in some areas is a barrier to effective communication and the provision of safe care.

- All transfer of care documents - e.g. discharge, referral and handover - even clinic letters - these are all basically the same structure. They are dependent to some extent on medications, allergies and observations (investigations) being coded, however we can iterate accordingly.
  - Use the same template for all transfer of care documents - acknowledge that care may be divided. Enable division and combination of TOC and care plans.
  - There are two document templates that cover >80% of information transfer:
    1. Transfer of care (referral, discharge, clinic letter) - this is a clinician to clinician standard (with copy to patient).
    2. Care plan - this is a co-produced document with subjective fields like 'my preferences, my goals, actions and outcomes'. This is the clinician to patient interface and should accompany the TOC (with copy to other clinicians)

- SNOMED, dm+d, staff ID
  - Lots. The challenge for me is a sufficient mass of people across strategy, policy, implementation, suppliers and operational having a collective understanding of the importance, relationships and dependencies to deliver. That detail is complex but I would suggest we think about how we could simplify that to support that critical mass being achieved. For me I think investment in a partnership with a quality animation agency would help looking at what the Kings Fund and others have done and then backing that up with long term comms and engagement plan with that animation the core of the plan.

- Get the IDs (staff and pt) right first then medications
  - Tons but we have to do this

- FHIR profiles to support Digital Child Health…. standards and regulation
  - Supplier capacity…. need SROs to prioritise or provide additional funding
- Unsure

- Not enough space to cover this!!! Will talk to Amir.
  - Supplier lock in

- Comprehensive medicines data is dependent on dose syntax, allergies, dm+d and SNOMED-CT
  - There are complexities with many of these - a good collaborative working process with representatives from a wide range of clinical and technical stakeholders will help to overcome them.

- I would consider most of these to be NHS standards / long term requirements so I find it difficult to prioritise.
  - Main issue is support by commercial systems.

- Medicines management which must include the visibility across the NHS of hospital only administration/ prescription of meds including in-patient drugs, outpatient infusions and outpatient prescriptions. Second I would have discharge and out-patient data and Next I would have all appointments held across the NHS in one place including therapy and diagnostics.
  - Data is not held consistently across organisations- paid workstream to standardise and improve the quality of data across all NHS organisations

- CareConnect profiles being available however the agreed prioritised Use Cases are the dependency of this.
  - Resources in curating the nationally defined standards.

- Patient preferences

- Meds, Allergies, Investigation, Hand-overs (discharge data)
  - Getting all to agree. Need for unified Terminologies (e.g. SCT) and unified data standards is not easy. Content of data flows is not easy

- ED Discharge Summaries

- You should have designed your questionnaire to capture this by asking to rank items not rate them individually
  - Interoperability can only achieve limited data sharing of a small number of high value items - It's a useful first step but will not deliver the data fluidy needed to deliver frictionless care - For that you need an open platform

- Keen to also see components for:
  Staff ID and legitimate relationships/permissions
  Tasks
  Messages

- Discharge summaries are key

- The order that brings the greatest benefits, soonest
  - Suppliers - mandate process

- Appointments, add info to health care record and the rest.
  - There will be challenges no doubt but all worth it. Happy to help with the implementation :-)

- I would place this as a 4 on the scale used elsewhere on this form.
  - Calculating genuine capacity is difficult from an organisational perspective, rather than a technical perspective. We can calculate average historic capacity for certain activities and even take into account known future events such as annual leave, but circumstances change and real capacity is very fluid.

- Exchange of medications and allergies across/between all care settings in a structured (machine to machine) format is critical including the ability to add/amend/remove medications or request such changes
  - not technical - just a willingness to do it and perverse priorities. The NHS consistently misses the low hanging fruit and is driven by politicians trying to grab the prized red apple at the top of the tree without any means of climbing it - and continuing the analogy, shaking the tree or shouting at it doesn't work!

- Transfers of care, one medication record
  - Inertia in the market, I fear GPIT futures will struggle to deliver. Getting timely SNOMED coded source information in an Acute environment.

- Dm+d

- Sharing data that currently exists (e.g. documents, images and tests), rather than Medication which will take a lot longer to standardise (because of low adoption of SNOMED). Sharing documents etc paves the way for Medication and can be achieved by organisations with low to high capability.
  - NHS tends to view problems in isolation, we need to look at sharing along a patients (generic) journey and not focus around organisation/service requirements at this time. Talking problems in isolation will lead to silos.
  - Many of the suggested solutions are focused around existing processes such as handovers while necessary these focus the interop on existing paper process (does the ED dept need to wait for the handover to view the casualties record or can it be shared beforehand??)

- NHS Number

- Use of structured and actionable data, e.g. medications, allergies, problem list and immunisation

- Structured Medications are the main priority as they cut across all other priorities in some way e.g. They are part of a ToC document for discharges.
  - Supplier capability. Structured recording practices.

- All together

- Medication interoperability is important, esp. meds reconciliation

- APIs to core clinical systems

- List them here. IHE middleware standards for registries (XDS), and permitted use of multiple content standards such as CDA FHIR OpenEHR. In addition the co-existence of pragmatic roadmaps for presentation from multiple disparate source systems seems vital, including PDF (phase out asap but do not hinder), and agile approach to emerging issues as implementation issues become apparent.
  - Sociotechnical issues will defeat this unless there is a serious generic approach regionally then nationally to address how health communities use their technology tools to improve information availability for front line care, and use the data

- Medication and allergies; discharge documentation
  - Choose a standard, publish the specification and then use it - refine it later after it is used - don't keep changing the specification all the time while people are trying to develop against it. Where possible until the NHS has its own specification (does it truly need its own?) use a standard that already exists - we can't keep waiting for "jam tomorrow"

- Medications and encounters have some good foundation work and also may be more straightforward than some other areas
  - Perfect getting in the way of good! / Risk of too much focus on theory and 'academic' side of things rather than learning through the practical delivery
- Any medicines related components
  - Legacy systems & processes

- All

- There are large dependencies on how the app and the use of apps linked to this could be commissioned a) by licence b) by the drawer down of data and it would be good to understand the national direction on this and if the national team are looking at procuring on behalf of the system with set costs like the NHS supply chain.

- Transfer of Care data; SNOMED CT; PHR
  - NRLS being bottleneck; roadmap

- I believe that you need a top down approach to creating common information models (FHIR) and you need a bottom up approach to describe what each organisation has collected and the formats that they've collected it in (metadata management)
  - Creating compelling business cases is not easy when you are dealing with middleware - it is often difficult to justify the cost of implementing something that will have benefits over the next 20 years rather than the next 6 months.

- Sending and receiving of structured documents/messages to support paperless objectives and efficiency savings.
  - Its key that national target architecture is defined to support the future growth of these transactions. Multiple local initiatives using similar (but different) technologies can be harder to support at scale. We need to understand what the core national components are so we can begin to plan in how to support them ie SSP, NEMS, LEMS, NRLS, NFMS etc.

- The order would start with what can save a life, then support life, then improve, then nice to know - needs a clinician to give the details though.

- Always a supplier dependency for the EPS elements but this should be easy for them. In most countries, they have to do direct point-to-point connections to specific pharmacy chains, whereas in the UK they only have to do one connection to EPS who then manage the distribution of the messaging from there.
  - More mandated timeframes to suppliers so they build into their development cycles.

- I can't answer this question

- NHS Number use; Staff authentication
  - Question

- Too many to mention in this response
  - Yes lots of challenges. Many can be resolved by iteration through the LHCREs and people implementing interoperability

- 1. NHS Identity Service
  2. Citizen Identity Programme
  3. NHS Record Locator Service
  4. CDS Hooks
  - NHS Record Locator Service should include support IHE XDS Affinity Domains in addition to FHIR

- NHS number to GP Surgery
  - Not particularly hard to do, or manage

- 5, 1 and 2 all high priority. 6 may take longer given current status of EPRs. 5 could be implemented immediately with benefits to LHCREs. 4 may take longer given culture change required and current status of EPRs
  - Cultural change is a major challenge - need to engage professional bodies in promoting this. Also case studies, pilots, evidence of benefits. Start small and build in agile chunks - not do it all then implement it. Getting co-production between professionals, vendors and NHS Digital (SNOMED/FHIR) will help overcome the immediate challenges, as has been happening in FHIR curation.

- Common coding structures and open API's
  - Lack of IT hardware within Acutes trusts preventing coding at the point of care

- 1. Acute discharge summaries to improve cost and efficiency and safety of unscheduled care 2. Medication and allergy reconciliation to improve medication safety through automation instead of laborious transcription. Also for 2 it would massively reduce the collective clinical time spent on reconciling changes from discharges etc. If we could just do these two successfully at scale, we would also boost interop confidence. These two are hugely beneficial for patients as medication concordance is one of the key ways patients interact with healthcare and the content of discharge summaries is often so rich that many patients with long-term conditions will be able to use self monitoring and activation apps to stay on top of their health. Furthermore, many clinicians "can and do" make good inferences of diagnoses from the medication list. Achieving a good discharge summary standard will by default also drive alignment of the GP record. Snomed-CT and dm+d are critical co-dependencies as is the requirement of STP /ACO regions to contractually agree with their providers and vendors an investment roadmap that is sufficiently long term to ensure development and delivery beyond 1 year cycles. Yearly budgeting will not suffice. NHS Improvement and NHS England should collaborate with INTEROPen and related bodies to push and push and push these two priorities until a tipping point of no return. NHS number becomes automatically subsumed into this. Staff ID will ease movement of clinicians to facilitate work shortages and I would put that 3rd.
  - Too many priorities, lack of focus, negativity of an "us" and "them" approach between NHS bodies and vendors as a whole, poor central-governmental leadership to tackle vendors who really do lock in patient data at taxpayers expense and insufficient engagement with patients to also raise this issue more publicly. When we, our friends, family and loved ones are unwell, it is the simplest of truths that the easier any justified movement of care data (structured or not) can move to the eyes and fingertips of care professionals and patients, the more benevolent and patient centred a society we have. Correspondingly, the leadership values must align and the necessary behaviours be visibly demonstrated. Technical challenge exists, but are all too often used to obfuscate deeper and more important human challenges of incongruent values.

- Transfer of care and care planning
  - Agreement and sign off of standards

- We need a document metadata standard. I know that the PRSB is working on this. Scotland has had one for a decade.
  - The challenge as usual is one of change management and leadership. The technology and standards framework for this is mature and proven. I'm referring to IHE-XDS.

- PHR. Start with the patient. That will drive interoperability elsewhere in the system. The more we give the patient the more they will demand.
  - Need to get primary and secondary care data from silos into regional care records. Not much incentive for existing suppliers to be commodotised. Will need significant determination from the top.

- No particular order

- PHR, Service directory, staff ID, patient ID, medications, smoking, alcohol
  - Yes. :-))
  - PHR interop with NHS records is a game-changer, and may have international support from individuals needing travel medicine, who tend to have cash to spend, so the apps can be chargeable. Most travellers are essentially healthy, but not all: the "portability" agenda can apply to all pts who are ill but must move between care settings.
  - Can we promote this at public levels and attract non-Govt funding from tech entrepreneur domain?

- Safeguarding - direct link with social care information sets.
  Pupil number - link with borough council information or national database.
  - no, should not, but pressed systems might not have the resources

- FHIR is being worked on as the basis for sharing data and alerts
  - Resources and capability locally

- The key component will be the ability for the clinical systems to generate and consume structured messages in a manner that permits them to integrate safely into the clinical record e.g. via MESH and FHIR.
  - Educating the clinical workforce in how to use and interpret the information. Avoiding Information overload by ensuring that the information which is shared is relevant, appropriate and timely.
  -
- Choose the domains where a quick delivery is possible.
  As discussed Andy Hadley mechanics of ToC?

-
  - Turn around a problem with a deliverable fix.

- Standardisation of coding and terminology (SNOMED CT and dm+d) are high priority to support interoperability and data sharing needs.
  - No major challenges come to mind outside of the typical Information Technology project challenges; I think there is an appetite for it across different areas of health and care.

- I rated those that are an immediate priority as high, those that are less of a priority for us I rated as 4. Those that we have already delivered or not applicable to us I rated lower (3 or less).
  - Coding and datasets- they need to be usable and in plain English. You should not require a degree in medical coding to be able to document medical notes. The systems for coding appear to be unfriendly/unintelligible. Clinicians do not have the appetite to learn another language and should not. Patients should be able to understand the codes relating to them.
  - Suppliers should be mandated to provide interoperability.
  - The SPINE/SCR should be improved so that the data within it can be integrated- the allergy details in spine is not detailed enough and does not map through to the terminology in the epma systems
  - the drug details are not adequate to utilise in the EPR epma as they are not coded in the same way.
  - The NHS number should be used across health and social care- council do not use this. The NHS number should become a citizen identifier if we are to integrate with these providers.

- The ability to share discharge information from the acute setting should be prioritised. Along with key information such as allergies and medications.
  - Completion of the definition of the FHIR standards for NHS use are a key driver to achieving the above.

- Have generally identified those relating to transfers of care as being highest priority but, not being a clinician, I can't assess the core clinical priorities for interop standards developments.

- Medicines reconciliation as top then all the structured data exchanges at care interfaces.
  - My answer to 1 demonstrates a problem. We are in danger of missing the conversational layer out in the socio-technical models of data exchange.

- 1. Identity 2. CareConnect across all major domains 3. Coded concepts

- - Trade off between flexibility and complexity of profiles - use hierarchy / inheritance wisely. FHIR backwards compatibility - use mature resources for important domains, even if they are not the closest fit. Experiment with immature resources on non-core domains.

- Social Care

- Just meds would be a start!
  - Yes, technically and legally challenging

- SNOMED, dm+d, NHS Number, Structured Allergies, Structured Medications (including dose syntax) are highest and dependencies.
  - Adoption across systems so that a communication can be effected. ISNs do not achieve this as not all customers upgrade to compliant version.

- More emphasis needs to be in developing systems in community healthcare, community mental health and social care. Otherwise, just like suboptimal PLICS costing systems in community is negatively impacting accurate healthcare costing , similarly suboptimal IT infrastructure in community will become the limiting factor/ codependency for interoperability.
  - 1) work on trust, relationships and be genuinely interested in other organisations' interests (within the ICS/STPs) - "what goes around comes around" approach rather than "win win".
  - 2) try for governmental policy to NOT change for next 10 years and allow time to make such change that takes time.
  - 3) focus on outcome based healthcare
  - 4) tap on intrinsic motivators (higher shared purpose) of commercial organisations, not commercial (extrinsic) motivators.

- Documents, Coded Diagnoses, Coded Drugs... we need to populate Discovery as part of One London LHCRE
  - No, just need implementation support and finance. We are working well together thank you

- Staff ID register is important and may have been put in a lower priority than it warrants. Multiple clinicians work at simultaneous sites, or have career moves, and this data is essential for good governance.
  - Multiple challenges but we need to communicate the end goal and purpose well to justify it. I see the top benefit is on patient mobility - patients can move and their care can continue with the benefits of the same information available to clinicians as before.

- 1. Building of vendor neutral open standards data bus connecting across health & social care, distinct from the main EHR.
  2. Leveraging of open APIs to allow user-facing apps to interact with health data.
  3. Development of patient portals for a variety of clinical scenarios
  - Vendors still not fully bought into the implications of true platform architecture interoperability? Need for the community to impress upon vendors a new business model not based on storage of the data, but on providing great user experience and workflow and analytics. Vendors sometimes wish to control the ecosystem - this is counter-strategic, and we need to help promote a cultural change where the data persistence is not "in the GP system" or "in the hospital system", but stored in a vendor neutral architecture, avoiding duplication, and minimising the transformative exchanges between clinical systems.

- Common language across inpatient, community and voluntary services
  - There is no time based - sense of urgency around delivering on the programme. The programme needs political steer and the general public should be aware of the lack of progress.

- Availability of standardised open API's in primary care clinical systems

- I think the priority should be based around the care settings that are ready to adopt these standards

- Eprescribing observations

- System, User and Citizen (patient) Authentication

- SNOMED CT and FHIR need agreeing first before we can accomplish the aims to better share discharge summaries etc.

- As a non-clinician technician, I'm refraining from prioritising the Care Process & Handover components. Others are better placed to judge the systemic/clinical/patient priority here.
  Regarding the foundational, most of these are in use. Prioritisation inversely reflects maturity of its use within the interoperability space. Critical co-dependency here is clarifying how domain semantics are split out between the FHIR resource/profile and the SNOMED-CT value-sets that are bound to them.
  - As noted above, lacking practically-based (i.e. implementable) principles/heuristics regarding representation of semantics. Similarly, don't have relative priorities for getting the data flowing versus engineering and exposing the data as relevant, re-usable resources.

- We already have massively complex site based EPRs. We need the system to exchange them to be 100% reliable and BAU. There's no point in beaming more and more into each silo if it can't then follow the patient to the next.
  - Yes, not seeing the wood for the trees. This reaching out for views is welcome and is the correct way to set out priorities.

- 1. Medication (including dosage)
  - dependency is the *universal & uniform* recording of medication in all care situations
  - need method of recording medication prescribed/controlled in other settings, (e.g. hospital prescribed medication in GP EPR) *and* updates when meds prescribed.
  2. allergies
  - dependency is suitable method of recording true allergies & adverse reactions i.e. life threatening (anaphylaxis) vs those which stop re-prescribing to individual (e.g. gastric sensitivity to erythromycin or side-effects) . NOT POSSIBLE IN READ CODE
  - also description of the reaction
  3. pathology
  Even with ICE, if an investigation is performed at a hospital/lab other than the one(s) for which a GP practice (or hospital) has contact, it may be impossible to find what test has been ordered/performed or the context/history/requester involved.
  - standardisation of units & normal ranges - especially when results are to be graphed.
  - consideration needs to be given to interpretation of results & communication both to HCPs who did not order test, & to patient - especially in view of patient record access.
   4. handover documents (putting hospital discharges, referrals, ambulance, emergency care together)
  - dependency is having the system & training to ensure that these are completed in timely fashion, & communicate not only what happened but also the future care plan & who should do what.
  i.e. communicate
  - Existing systems e.g. GP, hospital & other care setting systems, are mission-critical but designed before any open standards were developed.
  - If SNOMED is to be used throughout the health & social care system at time of consultation, those not accustomed to Coding will need to change their record entry practices: without suitable software (& EPR structures & data entry interfaces), training and motivation this is a challenge.
  - Sorry, no suggestions - apart from making it easier & quicker to enter data in the required manner than not.
  - Also start education at pre-clinical/ undergraduate level, & provide a Common User Interface for staff & trainees who move between institutions.

- Any element related to or giving detail to the Ambulance Request message. Particularly gazetteer handling, UPRN usage within addresses.

- - Using a single source for gazetteer data (ideally the Ordnance Survey Address Point Premium data) this would mean all 111 and 999 suppliers and providers using a single source.

- 1. outpatient clinic letters -- because selfishly, we are working on them now & it would be good to get the structure right now (currently Kettering)
  2. allergies & Meds -- because it would help reduce transcriptions, reduce risk
  critical co-dependencies -- TPP and EMIS!!
  - Vendors.
  - We should shake our collective fists at them. Suspect it is like sword-fighting windmills though. It will need senior NHS/Political will to hold them to task.
  - (not all of them -- some are great)

- Meds. Allergies and Diagnosis being shared must be the top 3.
  - Medications in particular are really complex. How do you structure dosing to suit all drugs?m Think about prednisolone. Also difference between Hospital and GP Prescribing. We must build a roadmap for this and not try and leap to perfection in a single bound.

- Mental health depends on whether the sector will achieve equal status in NHS prioritisation

- NHS Number, SNOMED CT; these are foundations and getting the data quality right here will ensure longevity of our work.
  - Yes; we need to make it easier for suppliers to use the SPINE services (especially SMEs).
  - The SNOMED codification requires on the ground clinical engagement
- As a local authority respondent the social care handovers are the most important priority area. Of course, these can only be effective if supported by a standard coding schema.
  - At the moment there is a significant weight of expectation that improvements are made to the provision of care within & between NHS settings. Therefore the priority for social care handovers may not be seen as of such significance.

- Care plans first

- Over many years within the shared record space the potential benefits from 'Medicines Reconciliation' have repeatedly been described as a big prize so that tops my list.....but for this work to be successful we need to see a continuous flow of standards into action. So I would like

to see a priority order that ensures a flow in delivery so we see real life delivery this month, next month, the months after and so on. That means some of the longer term stuff needs starting now for future delivery, alongside more rapidly achievable pieces.

- ○ Loads of challenges - technical, commercial, organisational, attitudinal, etc.....all of which boils down to 'stuff that needs working out'....the way to overcome it is to relentlessly focus on our duty to the people we serve, our collective desire to make health & care better and our opportunity to create a legacy our children will thank us for. These triple aims unite us and will help us override any of the challenges we face along the way.

- Get data calls (server side not client)
  - ○ commercial

- This is a difficult question, as I am not a clinician, and so I would not know which component would save the most lives, or make the most positive benefit to the patient, or which would improve and help clinicians make better decisions. There is also a symbiotic nature of the components, as one component may have many relationships with other components.
I would like to see pathology messaging improved, currently it has a reporting function, but the labs wanted electronic requesting. I really hope the proposed pathology component, is not just a replacement of the current Edifact messaging (more than a decade old), but incorporates all the changes that have occurred both in terms of technology. Medical and scientific innovations over the last few years.
Whilst I appreciate the READ codes will be replaced with SNOMED CT, I'm not sure how much difference this will make to the patient, or the lab staff, possibly it might benefit in terms of big data analysis and querying of data to look for trends.
I suggest, it's worth considering this article, though written in 2014, it is still relevant today.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204239/>
"LIMS systems of the future will be very different animals from those in use today...Optimal use of pathology services will depend on greater involvement of IT in the pre- and post analytical phases, both to manage demand and to encourage appropriate test requesting. This necessitates more sharing of information between different clinical systems, and hence improvements both in standardisation and in communicability"
  - ○ The cost, does the NHS have the funds, in this atmosphere of austerity? What is the impact of the cost of Brexit, not just in terms of NHS funding, but in terms of NHS staff recruited from Europe. Can NHS Digital cope, with the proposed job cuts of around 800 staff? Will the Government priorities change, not just because of Brexit, but due to technology innovations? For example, consider Cloud computing, whose cots have dropped dramatically over the last few years, where data may not need to fly around various systems, but systems could query a "virtual NHS cloud", this cloud containing the longitudinal record of all patients, having the advantage of this "virtual NHS cloud" being the one source of truth. So for examples GP system, would not need to update their own systems with data on their patients who recently had a hospital admission, they would just query that information on this "virtual NHS cloud". There are other disruptive technologies like distributed digital Ledger technologies, e.g. Blockchain (the technology behind Bitcoin) that is

being researched for clinical applications, For example, consider, FHIRChain developed by Vanderbilt University and Varian Medical Systems for confidential sharing of patient medical records:
<https://engineering.vanderbilt.edu/news/2018/team-develops-capabilities-more-secure-blockchain/>

- From a primary care perspective, reducing the loss of data between care interfaces are the key, particauly between primary and secondary care

- ToC, ADW, NHS Number, SNOMED, Med Language
    - 1) Aligning strategies across care settings to integrate with to supplier development road-maps
    - 2)Agreeing on information governance between stakeholders
    - 3) Trusts ability to adopt workflow changes necessary to meet these standards/changes

- No answer; that needs to be agreed by the clinical world.

- Inter organisation discharges.
    - Over complicating the message content and long drawn out curation of profiles that are not critical.

- SNOMED CT bound meaningfully with clinical information models
    - Religious belief and conflict of Interest of Messages standards followers

- Organisation reference is not mentioned and its profile needs be raised. The information is available via the ODS API Suite which offers interfaces to 2 standards - ORD (see DCB 00090) and FHIR STU3
    - None - the data is available via completely open interfaces available on the internet for all to access and consume the data.

- The views provided are my own rather than my organisation and I don't have a suggested order.

- Ability to send FHIR documents from patient into GPSoC systems

- Safeguarding concerns, Discharge summary with Meds, A&E Summary with Meds, GP Meds, Clinic Letters
    - My org is currently out to tender for an ePR due to having a green screen legacy PAS - until we resolve this, we are limited in terms of our contribution, but it does mean our new system should have been procured with good supplier commitment re APIs..... you'd like to think......

- As a software supplier, the priorities listed are based on our community members' experiences and successes with interoperating with other organizations. We would recommend first implementing discharge summaries across different care settings, using established, proven standards, such as HL7 CDA templates.
  - We strongly recommend re-using existing international standards, such as those defined by HL7 or IHE, when designing a strategy for UK-based interoperability. Deviations from these established standards will increase lead time to delivery and implementation of such functionality across healthcare organizations.
  - Additionally, we'd recommend the prioritization of interoperability where widely available code sets support the discrete exchange of data. Allowing room for customized coding systems will lower the quality of data exchanged by healthcare providers.

- Standardised messaging
  - Data Quality - need for greater audit of data to increase quality

- Medication prescriptions and pharmacy dispensing information would be top priority with a co-dependency on allergies and dm + d adoption.
  - The CareConnect resources for Medication (Request, Statement etc) can be implemented as free text with no coding (dm+d or proprietary) and yet still be considered compliant which prevents Med Rec from being user friendly for clinicians (ie avoid them rekeying the data).

- Ambulance Handover, Discharge summaries - improving data transfer when patients cross organisational boundaries Appointments - reduce wastage
  - organisation readiness and available technical skills within organisations to deliver. Supplier maturity to deliver. Variation of suppliers.
  - Digital Academy not just for leaders but for on the ground delivery teams.

- Medications and allergies across care settings

- Authentication, followed by authorisation
  - Agreeing how local and national services performing the same capability will work together without conflict

- Appointment booking (with supporting authorisation), followed by an update to existing CDA-based transfer of care between UEC providers and post-event summaries sent to patients' GPs.

- Use of NHS Digital Spine Secure Proxy as a national broker might cause some 'proprietary' lock-in and dependency on single system.
- Risk of multiple auth implementations causing too much work for system suppliers

- Use of FHIR as a foundation data standard
    - Overcoming proprietary behaviours by large suppliers and concomitant data hoarding by healthcare professionals

- Outpatient Clinic Letters
  Emergency Care discharge Summaries
  Ambulance Handover

- Only one - do not know co-dependencies