Good Practices	The German Corona Consensus Dataset (GECCO)	
Organization*	**Hospital Charité – Universitätsmedizin Berlin** Innovative capacity and responsible governance, for the benefit of patients and society - these are the central tenets behind all of Charité research endeavours. At Charité, approximately 4,454 researchers are actively engaged in the development of pioneering innovations in the field of medicine. Committed to the highest standards of quality and sustainability, they work across 1,000 projects, working groups and collaborative projects. There is a particular focus on the interface between basic and patient-oriented research, which seeks to foster interdisciplinary collaborations with both national and international partners. Harnessing the potential of this approach is of particular importance to Charité given that the most significant scientific developments are likely to arise from interdisciplinary cooperation. In addition to its role in research and teaching, the Hospital's fundamental mission also includes the care and treatment of patients. With 692,920 outpatient cases and 152,693 inpatient cases a year, Charité treats more patients than any other university hospital in Germany and, as a result, is able to draw on a wealth of experience and expertise. The hospital comprises approximately 100 different clinics and departments covering the entire spectrum of modern medicine.	
Name of expert& Position in the Organization	Dr. med. Peter Gocke, Chief Digital Officer	
What was the interoperability challenge for health care providers that you have addressed? (What & Why, Scope of interoperability project)*	The COVID-19 pandemic has led to a surge of research activity. While this research provides important insights, the multitude of studies results in an increasing fragmentation of information. To ensure comparability across projects and institutions, standard datasets are needed. The "German Corona Consensus Dataset" (GECCO) is a uniform dataset that uses international terminologies and health IT standards to improve interoperability of COVID-19 data, in particular for university medicine.	
Howwasthischallengeaddressed?*	Based on previous work and in coordination with experts from university hospitals, professional associations and research initiatives, data elements relevant for COVID-19 research were collected, prioritized and consolidated into a compact core dataset.	
	< 1 year	2020
Whatwerethe major enablers and pre-conditions?	Previous international work served as a basis for the dataset.To ensure interoperability, care was taken to build on previous work where possible, in particular the FHIR profiles of the German Medical Informatics Initiative, the International Patient Summary (IPS), the Logica COVID-19 profiles and the FHIR base profiles of HL7 Germany. FHIR profiles were	

	defined using Forge and published on the Simplifier platform.		
Whattype of tender didyouuse ?*	Direct Award of Contracts		
	Prior Consultation		
	Public Call		
	Invitation by Grant Agreement		
	Other:		Research project funded by the Federal Ministry of Education and Research without industry involvement.
Cross Border Relevance (if any)*	Information exchange for cross border patient care		(✓)
	Information exchange for public health and secondary use		
	Information exchange for the patient		
Which interoperability use cases have you addressed?*	Laboratory orders/results		✓
	Imaging orders/results		
	Medication Prescription/dispensation		✓
	Discharge letters		
	Patient summaries		✓
	Patient referrals		
	Teleconsultation (patient/doctor)		
	Telecollaboration (doctor/doctor)		
	Public health reporting(reportable diagnosis & key interventions)		✓
	Other:***e.g. Hospital Admissions/Bed Management at the regional level***		
	Other:***e.g. enter your UC name***		
	Other:***e.g. enter your UC name***		
What interoperability standards and profiles have you used for each of the above use cases?*	Laboratory orders/results	LOINC	
	Imaging orders/results		
	Medication Prescription/dispensation	ATC	
	Discharge letters		
	Patients summaries		
	Patient referrals		
	Teleconsultation (patient/doctor)		

	Telecollaboration (doctor/doctor)	
	Public health reporting	
	Other: ***e.g. Hospital Admissions/Bed Management at the regional level***	The dataset was mapped to international terminologies (SNOMED CT, LOINC, UCUM, ICD-10-GM and ATC), and the HL7 Fast Healthcare Interoperability Resources (FHIR) standard was used to define interoperable, machine-readable data formats.
	Other:***e.g. enter your UC name***	
	Other:***e.g. enter your UC name***	

How did your project define its interoperability specifications?*	They were created by the project based on our own selection of standards and profiles	✓
	We referenced/reused the national interoperability framework	
	We ask the main vendor to set these specifications	
	Other:	FHIR profiles for selected data elements were created by the project team. The following FHIR resources were used to model the data elements: Patient, Consent, Observation, Condition, Procedure, Encounter, Medication and MedicationStatement. The FHIR profiles can be accessed on Simplifier.
What interoperability testing strategy have you	Used a project mandated specific set of interoperability test tools before systems where interconnected?	

employed?*	Reused an existing set of interoperability test tools that were customized before systems were interconnected?	
	Tested the point of care systems by connecting them to a lab version of central systems	
	Other:	
What were the main implementation challenges you encountered	Spent a lot of time to connect each point of care systems	
	When interoperability issues occured, it was complex to decide which system is at fault	
	We had long discussions on which standards to select	
	Other: ***e.g. enter your UC name***	Some data elements were only relevant to certain specialties. The editorial team decided to exclude these data elements from the core data set and to include these data elements in domain-specific extension modules, which will be specified in more detail at later stages of the project. Extension modules currently planned are: laboratory, diagnostics, immunology, gynecology and pregnancy, epidemiology, pediatrics, intensive care, oncology, radiology, virology, psychiatry and neurology (these extension modules are also made accessible on the ART-DECOR platform).
	Other: ***e.g. enter your UC name***	
Who were the perceived beneficiaries of your interoperability initiative?	Citizens/patients (e.g. improved care outcomes, improved citizen experience)	**Indirectly**
	Health Professionals(e.g. improved workflow, access to information, re-use of data in research)	**Directly**
	Hospital administration (e.g. reduction of wast, cost savings, improved monitoring)	
	Financial and social factors (e.g. eHealth Mmarket competitiveness, more jobs)	

	Health System (improved efficiency, quality and effectiveness, supporting learning systems)	**Indirectly**
Did your project used the ReEIF5 layer model to analyse its interoperability?		
Based on your experience, what can you recommend to others?	Small healthcare organizations (doctors, pharmacies, etc.	
	Large healthcare organizations	A key factor to the successful application of standard datasets is a close collaboration with the scientific community. Therefore, it is recommended to include clinicians from a wide variety of medical disciplines and professional associations as well as experts in digital health, standardization and clinical terminologies. Also you should collaborate with standards developing organizations such as HL7 as well as other initiatives aiming to improve health data interoperability, e.g. the Medical Informatics Initiative.
	Policy makers at EU level	See below.
	Policy makers at Member State Level	For the successful application of standard datasets, it is also important that these datasets are embedded in larger infrastructures for secure and interoperable data sharing across institutions. Initiatives like, for example, the National COVID Cohort Collaborative (N3C) in the US, OpenSAFELY in the UK or the international project Secure Collective Research (SCOR) are developing

		platforms for a secure, cross-institutional analysis of COVID-19 data. Similarly, GECCO is part of the German COVID-19 Research Network of University Medicine, which aims to bundle the resources of German university hospitals to improve diagnostics and treatment of COVID-19 patients. The network also includes a research data infrastructure for the secure and interoperable data exchange across university hospitals, for which GECCO provides a standard data structure.