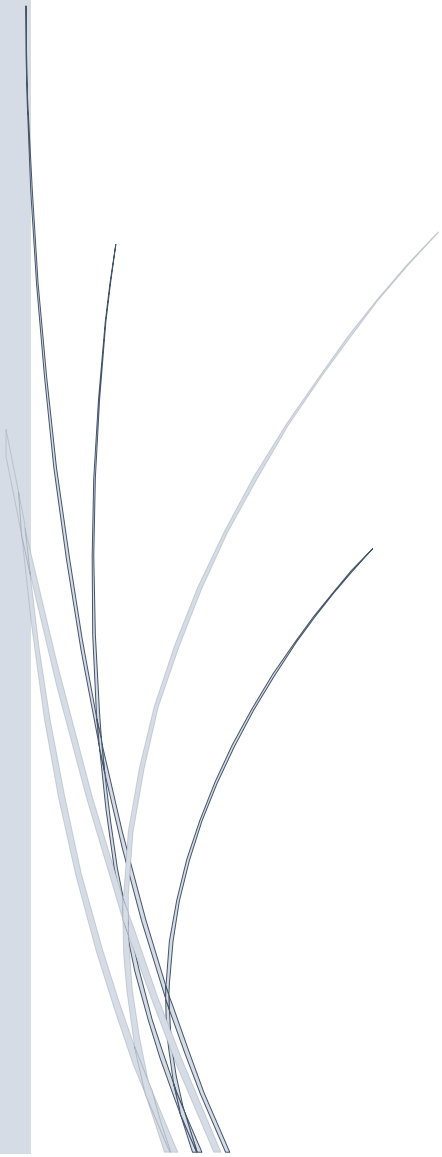
USE CASES

FHIR Care Communication



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Content

1 Introduction

This document contains various use case descriptions and is part of the overall documentation on Med-Com's new FHIR standard for care communication, henceforward referred to as FHIR-CC.

The documentation consists of 3 parts:

1. The textual part (introduction to the standard and the health professional recommendations)
2. Documentation, the standard profile itself
3. Use case descriptions

Thus, the use case descriptions must be read together with the other documents.

The use case descriptions are focused on the technical implementation for the IT system vendors and those responsible for implementation in the regions, municipalities, and amongst the general practitioners (GPs). Care communication is used by many different parties and professional groups in the healthcare system and for various purposes, such as ad hoc communication. Therefore, it is not possible to provide use cases that illustrate all possible scenarios. The selected use cases have been selected in order to demonstrate the content and functionality of the FHIR Care Communication. The use cases are divided into requirement-specific use cases and optional use cases. Touchstone examples of a subset of the requirement-specific use cases will be made.

The use cases are validated in collaboration with relevant parties, including the established working group and vendors of the electronic health (EPJ), care (EOJ), and GP (LPS) records.

1.1 Method for use case descriptions

The use cases are created on the basis of KOMBIT's methodological handbook for use cases with a few adaptations. Each use case contains the listed elements below. Here is a brief explanation.

Element	Explanation
ID	Unique ID
Initiator	Name of the initiating actor (can be a user (e.g. nurse or doctor) or a system (the actual system behind)).
Purpose, description and scope	Short description of the purpose of the use case, possibly with delimitation or elaboration of the use situation.
Conditions for initiation	The conditions that need to be met for the course of events to be completed and thus achieve the end result.
Reason for initiation	The event that triggers the actor's actions in its typical interaction with the system.
Actions	The course of actions that - without interruption - leads from the initiating event to the end result.
End result	The desired goal with the specific use of FHIR-CC.
Alternative actions	Alternative actions in the event of an interrupted interaction with the system, which ends with an error situation or with a resumption.

2 Use cases

The use case descriptions illustrate several situations of application for the FHIR Care Communication in regions (hospitals), municipalities (home care), at the GPs and pharmacies. The actors will act as sender and recipient, respectively, in different scenarios, so that requirements for the represented systems are identified.

The use cases describe, in detail, examples of an actor's typical interaction with the system. See *Table 1* for the different use cases. Each use case is associated with one of five different courses of action. A description of the courses of action can be found in *Table 2*. In several of the use cases, alternatives to the typical interaction will be presented, where error situations, as well as deviations from the typical interaction, have been considered. A description of technical (alternative) actions can be seen in *Table 3*.

2.1 Overview of use cases and related actions

Use case	Description	Sender	Recipient	Action
Obligatory use cases				
2.2.1	Recipient of FHIR-CC reads the message	-	-	-
2.2.2	Receipt of a forwarded FHIR-CC	-	-	-
2.2.3	Recipient of an answered FHIR-CC reads the message	-	-	-
2.2.4	Recipient of FHIR-CC with priority reads the message	-	-	-
2.2.5	Hospital worker forwards FHIR-CC from the municipality to another hospital	S1	S2	3.4
2.2.6	Home care nurse contacts GP with questions about medication	K1	PL1	3.1
2.2.7	The GP answers the questions about medication from the home care nurse	PL2	K2	3.3
2.2.8	A hospital worker contacts a municipal substance abuse centre regarding a citizen's history	S3	K3	3.1
2.2.9	A hospital worker registers that a citizen is dead, and the system automatically sends a FHIR-CC to the citizen's GP	S4	PL3	-
2.2.10	Hospital answers a FHIR-CC from the municipality regarding changed housing conditions	S5	K4	3.3
2.2.11	Home care nurse forwards a FHIR-CC to GP	K5	PL4	3.4
2.2.12	GP contacts a hospital department for further advice on a specific disease, including assessment of possible admission	PL5	S6	3.2
2.2.13	A hospital worker contacts a GP to obtain further information about a received referral	S7	PL6	-
2.2.14	Treating pharmacist (pharmacy) informs the citizen's GP about prescription renewal via a FHIR-CC	A1	PL7	3.2
2.2.15	Private group home contacts pharmacy regarding medication for a resident	Pr. B1	A2	3.1
Optional use cases				
2.3.1	The GP answers questions about medication from the home care nurse (inserts table)	PL8	K6	3.3
2.3.2	Home care nurse contacts hospital about changes in the citizen's housing conditions (mapping of predefined subject heading and category)	K7	S8	4.1
2.3.3	GP contacts hospital department in need of specialist knowledge (inserts URL)	PL9	S9	3.2
2.3.4	Home care nurse forwards a FHIR-CC to GP (with stated reason)	K8	PL10	4.2

2.3.5.	A hospital worker answers a received referral from a general practitioner (GP) with a FHIR-CC in need of further information	S10	PL11	-

Table 1: Use cases

General action	Description	Application	Use case
Obligatory actions			
3.1	Sending of a FHIR-CC with choice of category and self-written subject heading	3	2.2.5, 2.2.7, 2.2.13
3.2	Sending of a FHIR-CC only with choice of category	3	2.2.11, 2.2.12, 2.3.3
3.3	Answering of a FHIR-CC (category and subject heading are automatically filled in)	3	2.2.6, 2.2.9, 2.3.1
3.4	Forwarding of a FHIR-CC (category and subject heading are automatically filled in)	2	2.2.4, 2.2.10
Optional actions			
4.1	Sending FHIR-CC with choice of predefined subject heading (automatic category selection)	1	2.3.2
4.2	Forwarding FHIR-CC with stated reason for forwarding	1	2.3.4

Table 2: General actions

Technical alternative actions	Description	Remark
5.1	Entering the wrong personal identification number (CPR) – sends to the wrong recipient (e.g. a GP)	The resources from 'provenance' and 'encounter' are used to handle errors (see: http://medcom-fhir.dk/fhir/core/1.0/StructureDefinition-medcom-careCommunication-message.html, section 6.2.1.3.3)
5.2	When sending a FHIR-CC, a positive receipt is received from the receiving system	The message is correctly received in the receiving system
5.3	When sending a FHIR-CC, a negative receipt is received from a VANS vendor	Sender receives a negative VANSEnvelope message with description of an error. Sender must correct the error and resend the message with a new Bundle ID and with a new Message Header ID if the content of the message has changed
5.4	When sending a FHIR-CC, a negative receipt is received from the receiving system. The error is missing data	Sender must correct the error and resend the message with a new Bundle ID and with a new Message Header ID
5.5	When sending a FHIR-CC, a negative receipt is received from the receiving system, where the error is not related to the message, and why the message must be resent	Sender resends the message with the same Bundle ID and Message Header ID
5.6	When sending a FHIR-CC, no receipt is received from the receiving system	Sender resends the message with the same Bundle ID and Message Header ID. It is recommended that the message is resent no more than three times. If there is no receipt after the last attempt, sender must contact recipient regarding error tracing
5.7.	In the event of incorrect data, a correction to the previously sent FHIR-CC must be sent	the resources from 'provenance' and 'encounter' are used to handle corrections (see:

		http://medcomfhir.dk/fhir/core/1.0/StructureDefinition-medcom-careCommunication-message.html, section 6.2.1.3.4)

Table 3: Technical alternative actions

2.1.1 Obligatory use cases for test and implementation

2.2.1 Use case for receipt (generic example)	Recipient of FHIR-CC reads the message
Initiator	User: Recipient
Purpose, description and scope	Recipient has received a FHIR-CC and reads it
Conditions for initiation	A FHIR-CC is sent to the recipient Recipient is notified when a new FHIR-CC is received
Reason for initiation	Recipient is notified of a new FHIR-CC and wants to read it
Actions	• System: Recipient is notified that a new FHIR-CC has been received • System: Saves data from the received FHIR-CC • User: Chooses to open FHIR-CC • System: Shows sender, category, and if possible, subject, message text and author including date and time, name, position and telephone number on the received FHIR-CC as well • System: Shows all data that is a part of the message (e.g. table and attachment) • System: If there are attachments, they are safely stored in an appropriately secure location at receipt • System: Sends positive receipt
End result	The recipient has received a FHIR-CC and possible attachments
Alternative actions	
Remarks	

2.2.2 Use case for receipt of a forwarded FHIR-CC (generic example)	Receipt of a forwarded FHIR-CC
Initiator	User: Recipient
Purpose, description and scope	Recipient has received a forwarded FHIR-CC and reads it
Conditions for initiation	A forwarded FHIR-CC is sent to the recipient Recipient is notified when a new FHIR-CC is received
Reason for initiation	Recipient is notified of a new FHIR-CC and wants to read it
Actions	• System: Recipient is notified that a new FHIR-CC has been received • System: Saves data from the received FHIR-CC • User: Chooses to open the FHIR-CC • System: Upon receipt, marks the FHIR-CC as forwarded in the user interface • System: Shows last sender and the original sender who started the communication thread, category, if possible subject, if possible text indicating the reason for the forwarding if filled in, message text and author including date and time, name, position and telephone number on the received FHIR-CC • System: Shows all data that is a part of the message (e.g. table and attachment) • System: If there are attachments, they are safely stored in an appropriately secure location at receipt • System: Sends positive receipt
End result	The recipient has received a FHIR-CC and attachments, if any
Alternative actions	
Remarks	

2.2.3 Use case for receipt of an answered FHIR-CC (generic example)	Recipient of an answered FHIR-CC reads the message
Initiator	User: Recipient
Purpose, description and scope	Recipient has received an answered FHIR-CC and reads it
Conditions for initiation	An answered FHIR-CC is sent to the recipient
Reason for initiation	Recipient is notified of a new FHIR-CC and wants to read it
Actions	• System: Recipient is notified that a new FHIR-CC has been received • System: Upon receipt, marks in the user interface that the FHIR-CC is a response. • System: Saves data from the received FHIR-CC • User: Chooses to open FHIR-CC • System: Shows sender, category, subject if possible, message text and author including date and time, name, position and telephone number on the received FHIR-CC • System: Shows all data that is a part of the message (e.g. table and attachment) System: If there are attachments, they are safely stored in an appropriately secure location at receipt • System: Sends positive receipt
End result	The recipient has received a FHIR-CC and possible attachments
Alternative actions	
Remarks	

2.2.4 Use case for receipt of FHIR-CC with priority	Recipient of FHIR-CC with priority reads the message
Initiator	User: Recipient
Purpose, description and scope	Recipient has received a forwarded FHIR-CC and reads it
Conditions for initiation	A FHIR-CC with priority is sent to recipient
Reason for initiation	Recipient is notified of a new FHIR-CC with priority and wants to read it
Actions	• System: Recipient is notified that a new FHIR-CC with priority has been received • System: Upon receipt, marks in the user interface that the FHIR-CC has been sent with other priority than default • System: Saves data from the received FHIR-CC • User: Chooses to open the FHIR-CC with priority • System: Shows sender, category, subject if possible, message text and author including author and date, name, position and telephone number on the received FHIR-CC • System: Shows all data that is a part of the message (e.g. table and attachment) • System: If there are attachments, they are safely stored in an appropriately secure location at receipt • System: Sends positive receipt
End result	The recipient has received a FHIR-CC with priority and possible attachments
Alternative actions	
Remarks	When answering or forwarding a FHIR-CC, the value of priority is in principle always default

2.2.5 Use case for forwarding (from hospital to hospital)	A hospital worker forwards information from the municipality to another hospital, as the citizen has been transferred in the meantime
Initiator	User: Hospital worker
Purpose, description and scope	A hospital worker receives information from the municipality about a citizen's wound assessment with the attached JPEG. The citizen has meanwhile been transferred to another hospital, and the hospital worker, therefore, forwards the FHIR-CC as well as the attached file to the correct hospital
Conditions for initiation	The citizen receives home care from the municipality FHIR-CC is sent before receiving notification about change of hospital
Reason for initiation	A hospital worker is forwarding a received FHIR-CC with attached file.
Actions	• User: Chooses to forward a received FHIR-CC with attachment • User: Chooses all preceding text threads and attachments for forwarding • System: Inserts and attaches the text threads chosen and the attachment JPEG that needs to be forwarded • User: Chooses correct hospital as recipient • System: Automatically inserts the same category and subject heading when a FHIR-CC is forwarded • System: Shows category and subject heading to user • User: Selects another category and other subject • System: Shows category and subject heading to user • User: Writes text in the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, job title and telephone number • System: Sends FHIR-CC and attaches the updated technical communication thread[1] and attachments
End result	FHIR-CC is forwarded to hospital
Alternative actions	See technical use case 5.2 in *Table 3*
Remarks	

[1] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.6 Use case for sending (from municipality to general practitioner (GP))	Home care nurse contacts GP with questions about medication
Initiator	User: Home care nurse in the municipality
Purpose, description and scope	The home care nurse is unsure of the citizen's medication and therefore contacts the citizen's GP
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The citizen receives home care from the municipality The GP does not need to be able to sort the care communications and has not made a collaboration agreement on subject heading
Reason for initiation	The home care nurse is unsure of the medication
Actions	• User: Creates a new FHIR-CC • User: Chooses the citizen's GP as recipient • See actions 3.1 • User: Attaches a picture in the format JPEG to FHIR-CC • System: Adds attachment to the FHIR-CC, and ensures that message and attachments do not exceed 50 Mbit • System: Sends FHIR-CC and attaches the technical communication thread[2] and attachments.
End result	The home care nurse has sent a FHIR-CC with attachment to the GP
Alternative actions	See technical use case 5.5 in *Table 3*
Remarks	

[2] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.7 Use case for answering (from GP to municipality)	The GP answers the questions about medication from the home care nurse
Initiator	User: GP
Purpose, description and scope	GP answers questions from the home care nurse regarding the citizen's medication
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The citizen receives home care from the municipality The GP has received a FHIR-CC from the home care nurse
Reason for initiation	The GP has been contacted via a FHIR-CC by a home care nurse
Actions	• User: Chooses to answer a received FHIR-CC • User: Selects which preceding text threads to be included • System: Inserts the selected text threads and automatically inserts sender EAN of the received FHIR-CC as primary receiver, via lookup in SOR • System: Automatically inserts the same category and subject heading when a FHIR-CC is answered • System: Shows category and subject heading to user • User: Selects another category and other subject • System: Shows category and subject heading to user • User: Writes the message text User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, job title and telephone number • System: Sends FHIR-CC and attaches the updated technical communication thread[3]
End result	The GP has answered a FHIR-CC from the municipality
Alternative actions	• See technical use case 5.3 in *Table 3* • Is it possible for the doctor to change the primary receiver of the FHIR-CC • Sending a FHIR-CC with attachments that exceed the allowable size of 50 Mbit. • System: Informs the user that FHIR-CC exceeds the permitted size and therefore cannot be sent • User: Edits FHIR-CC so that the message is within the allowed size
Remarks	

[3] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.8 Use case for sending (from hospital to substance abuse centre)	A hospital worker contacts a municipal substance abuse centre regarding a citizen's history
Initiator	User: Hospital worker
Purpose, description and scope	A hospital worker contacts a municipal substance abuse centre upon the admission of a citizen to gain knowledge about the citizen's history
Conditions for initiation	The citizen is connected to a municipal substance abuse centre and the substance abuse centre can receive FHIR-CC
Reason for initiation	At the time of admission, a hospital worker has questions regarding the citizen's history
Actions	• User: Creates a new FHIR-CC • User: Chooses the substance abuse centre in the citizen's municipality as recipient • See actions in Table 3.1 • System: Sends FHIR-CC and attaches the technical communication thread[4]
End result	A hospital worker has sent a FHIR-CC to the municipality's substance abuse centre
Alternative actions	See technical use case 5.4 in *Table 3*
Remarks	

[4] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.9 Use case for automatically sending (in case of death)	A hospital worker registers that a citizen is dead, and the system automatically sends a FHIR-CC to the citizen's GP
Initiator	User: Hospital worker
Purpose, description and scope	A citizen dies during admission. A hospital worker registers the death and the system automatically informs the GP of the citizen's death
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The hospital worker registers the citizen as dead
Reason for initiation	A citizen dies at the hospital
Actions	• User: A hospital worker registers the citizen as dead • System: Automatically creates a new FHIR-CC • System: Chooses the citizen's registered GP as recipient • System: Inserts the national category 'Death' • System: The EHR system automatically inserts the user as author with title and telephone number • System: Sends FHIR-CC and attaches the technical communication thread[5]
End result	A hospital worker has registered a citizen as dead in the EHR system, which has then automatically sent a FHIR-CC with information about the citizen's death to the citizen's GP
Alternative actions	
Remarks	There is no user activity in connection with the FHIR-CC message itself

[5] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.10 Use case for answering (from hospital to municipality)	Hospital answers a FHIR-CC from the municipality regarding changed housing conditions
Initiator	User: Hospital worker
Purpose, description and scope	A hospital worker answers a FHIR-CC from the home care nurse in the municipality with additional comments on the citizen's needs at discharge
Conditions for initiation	Hospital has received a FHIR-CC regarding changed housing conditions from the municipality
Reason for initiation	A hospital worker answers a received FHIR-CC from the municipality with additional comments regarding the citizen's needs at discharge
Actions	• User: Chooses to answer a received FHIR-CC • User: Chooses which preceding text threads to be included • System: Inserts the chosen text threads and, via SOR look-up, automatically inserts the sender of the received FHIR-CC as receiver • See actions 3.3 • System: Sends FHIR-CC and attaches the updated technical communication thread[6]
End result	A hospital worker has answered a FHIR-CC from the municipality
Alternative actions	• See technical use case 5.6 in *Table 3* • It is possible for the sender of the answer to change the primary recipient of FHIR-CC • It is possible for the sender of the answer to choose another category and subject
Remarks	

[6] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction.

2.2.11 Use case for forwarding (from municipality to GP)	Home care nurse forwards a FHIR-CC to GP
Initiator	User: Home care nurse
Purpose, description and scope	The home care nurse forwards a received FHIR-CC to the citizen's GP
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The home care nurse has received an answer to a FHIR-CC from the hospital regarding the citizen's needs at discharge in relation to the changed housing conditions
Reason for initiation	The home care nurse needs to inform the citizen's GP about the changed housing conditions for the citizen as well as the hospital's comments about the citizen's needs
Actions	• User: Chooses to forward a received FHIR-CC • User: Chooses which previous text threads to include • System: Inserts the chosen text threads that are going to be forwarded • User: Chooses the citizen's GP as recipient • See actions 3.4 • System: Sends FHIR-CC and attaches the updated technical communication thread[7]
End result	FHIR-CC is forwarded to GP
Alternative actions	It is possible for the sender of the forwarded message to choose another category and subject
Remarks	

[7] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.2.12 Use case for sending (from GP to hospital)	GP contacts a hospital department for further advice on a specific disease, including assessment of possible admission
Initiator	User: GP
Purpose, description and scope	GP contacts a medical specialty at a hospital for further information and instructions regarding a citizen's condition
Conditions for initiation	The region's hospital departments are registered in SOR The citizen is in health insurance group 1 (has a GP)
Reason for initiation	GP needs to contact a specific hospital department
Actions	• User: Creates a new FHIR-CC • User: Chooses a hospital department as recipient of FHIR-CC with specialisation in the specific area • See actions 3.2 • System: Sends FHIR-CC and attaches the updated technical communication thread[8]
End result	The GP has contacted a specific hospital department for further advice and information
Alternative actions	The doctor tries to write a self-written subject in a FHIR-CC of more than 255 characters • System: Points out to the user that the subject in FHIR-CC exceeds the allowed 255 characters, and therefore cannot be sent • User: Edits the subject in FHIR-CC so that the subject is within the permitted length
Remarks	

[8] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.2.13 Use case for sending with priority (from hospital to GP)	A hospital worker contacts a GP to obtain further information about a received referral
Initiator	User: Hospital worker
Purpose, description and scope	A hospital worker contacts the GP for more information about a received referral.
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The hospital has received a referral from the GP
Reason for initiation	A hospital worker reads the referral but needs further information about the citizen
Actions	• User: Creates a new FHIR-CC • User: Chooses the citizen's GP as recipient of FHIR-CC • User: Chooses the category 'Regarding referral' from the category list • System: Indicates in the user interface that it is possible to prioritise the message • User: Chooses to indicate priority • User: Chooses to write a subject heading • System: Shows the user's selected priority, category and subject heading • System: Inserts the referral ID from the referral in the FHIR-CC message • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with name, title and telephone number • System: Sends FHIR-CC with priority as well as reference to the referral (location and EAN number) in the technical communication thread[9].
End result	A hospital worker has sent a FHIR-CC with priority to the citizen's GP
Alternative actions	
Remarks	

[9] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.2.14 Use case for sending (from pharmacy to GP)	Treating pharmacist (pharmacy) informs the citizen's GP about prescription renewal via a FHIR-CC
Initiator	User: Treating pharmacist (pharmacy)
Purpose, description and scope	A treating pharmacist renews prescription-only medicine. The pharmacist informs the citizen's GP about renewed prescription and documents the information afterwards
Conditions for initiation	The pharmacist has a location number and can send FHIR-CC The citizen is in health insurance group 1 (has a GP)
Reason for initiation	The pharmacist informs the citizen's GP about the renewed prescription
Actions	• User: Creates a new FHIR-CC • User: Chooses the citizen's GP as recipient of FHIR-CC • See actions 3.2 • System: Sends FHIR-CC and attaches the technical communication thread[10]
End result	The pharmacist has sent a FHIR-CC to the citizen's GP
Alternative actions	
Remarks	

[10] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.2.15 Use case for sending (from private group home to pharmacy)	Private group home contacts pharmacy regarding medication for a resident
Initiator	User: Support worker
Purpose, description and scope	A support worker at a private residence contacts pharmacy regarding dispensing medication to a citizen
Conditions for initiation	The pharmacy has a location number and can receive/send FHIR-CC The residence has a location number and can receive/send FHIR-CC The citizen is connected to a group home
Reason for initiation	Support worker contacts pharmacy regarding medication dispensing
Actions	• User: Creates a new FHIR-CC • User: Chooses pharmacy as recipient of FHIR-CC • See actions 3.1 • System: Sends FHIR-CC and attaches the technical communication thread[11]
End result	Private group home has contacted the pharmacy regarding medication dispensing
Alternative actions	
Remarks	

[11] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.2 Optional use cases for test and implementation

In the following, previously described use case examples are described, including optional functionalities.

2.3.1 Use case for replying (from GP to municipality)	The GP replies to the questions about medication from the home care nurse
Initiator	User: GP
Purpose, description and scope	GP replies to questions from the home care nurse regarding the citizen's medication
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The citizen receives home care from the municipality The GP has received a FHIR-CC from the home care nurse
Reason for initiation	The GP has been contacted by a home care nurse
Actions	• User: Chooses to reply to a received FHIR-CC • User: Chooses which preceding text threads to be included • System: Inserts the chosen text threads and automatically inserts sender of the received FHIR-CC as recipient • System: Inserts the entire care communication on the received FHIR-CC • See actions 3.3 • User: Chooses to insert a table in the message text as a further explanation • System: Sends FHIR-CC and attaches the updated technical communication thread[12]
End result	The GP has replied to a FHIR-CC from the municipality
Alternative actions	
Remarks	

[12] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.3.2 Use case for sending (from municipality to hospital)	Home care nurse contacts a hospital about changes in the citizen's housing conditions
Initiator	User: Home care nurse
Purpose, description and scope	The home care nurse uses FHIR-CC to inform the hospital about health-related information regarding an admitted citizen
Conditions for initiation	The citizen receives home care from the municipality. The citizen's housing conditions have changed during admission. Cooperation agreements have been entered in to between municipalities and region regarding predefined subject heading. A mapping has been made between the predefined subject heading and the national categories.
Reason for initiation	The home care nurse informs the hospital about the changed housing conditions for the citizen upon discharge
Actions	• User: Creates a new FHIR-CC • User: Chooses hospital as recipient • See actions in Table 3.5 • System: Sends FHIR-CC and attaches the technical communication thread[13]
End result	The home care nurse has informed the hospital about the changed housing conditions for the citizen
Alternative actions	
Remarks	*Testing this use case assumes that the system supports mapping between predefined subject heading and the national categories*

[13] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.3.3 Use case for sending (from GP to hospital)	GP contacts a hospital department for further advice about a specific disease, including assessment of possible admission
Initiator	User: GP
Purpose, description and scope	GP contacts a medical specialty at a hospital for further information and instructions regarding a citizen's condition
Conditions for initiation	The region's hospital departments are registered in SOR. The citizen is in health insurance group 1 (has a GP).
Reason for initiation	GP needs to contact a specific hospital department
Actions	• User: Creates a new FHIR-CC • User: Chooses a hospital department with specialty in the specific area as recipient of FHIR-CC • See actions 3.2 • User: Chooses to insert an URL in the message text • System: Sends FHIR-CC and attaches the technical communication thread[14]
End result	The GP has contacted a specific hospital department regarding further information and advice
Alternative actions	
Remarks	

[14] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.3.4 Use case for forwarding with stated reason (from municipality to GP)	Home care nurse forwards a FHIR-CC to GP
Initiator	User: Home care nurse
Purpose, description and scope	The home care nurse is forwarding a received FHIR-CC to the citizen's GP
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The home care nurse has received an answer on a FHIR-CC from the hospital regarding the citizen's needs at discharge in relation to the changed housing conditions
Reason for initiation	The home care nurse needs to inform the citizen's GP about the changed housing conditions for the citizen as well as the hospital's comments about the citizen's needs
Actions	• User: Chooses to forward a received FHIR-CC • User: Chooses which previous text threads that need to be attached • System: Inserts the chosen text threads that are forwarded • User: Chooses the citizen's GP as recipient • See actions 4.2 • System: Sends FHIR-CC and attaches the technical communication thread[15]
End result	FHIR-CC is forwarded to GP
Alternative actions	
Remarks	

[15] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

2.3.5 Use case for answering a MedCom message (from hospital to municipality)	A hospital worker answers a received referral from a general practitioner (GP) with a FHIR-CC in need of further information
Initiator	User: Hospital worker
Purpose, description and scope	A hospital worker contacts the GP who sent a referral in need of further information about the received referral.
Conditions for initiation	The citizen is in health insurance group 1 (has a GP) The hospital has received a referral from the GP
Reason for initiation	A hospital worker reads the referral but is in need of further information about the citizen and chooses to respond to the received referral with a FHIR-CC
Actions	• User: Chooses to respond to a received referral with a FHIR-CC • User: Selects which preceding text threads to be included • System: Inserts the selected text threads and automatically inserts sender of the received FHIR-CC as primary receiver, via lookup in SOR • System: Inserts course-ID from the received referral. • User: Selects the category “Regarding referral” from the list of categories • System: Indicates in the user interface that it is possible to prioritise the message • User: Chooses to indicate priority • User: Chooses to write a subject heading • System: Shows the user’s selected priority, category and subject heading • System: Inserts the referral ID from the referral in the FHIR-CC message • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with name, title and telephone number • System: Sends FHIR-CC with priority with technical communication thread attached[16].
End result	A hospital worker has answered a received referral with a FHIR-CC with priority to the citizen’s GP
Alternative actions	Other MedCom messages can also be answered with a FHIR-CC

[16] FHIR uses Provenance to link messages sent in the same message flow. Provenance contains reference to the event that triggers a message (e.g., a MedCom edifact message) and who triggered the event. Provenance also contains the status of whether it is a new message, an answer, a forwarding or a correction

3 Obligatory general use case actions for test and implementation

3.1 Sending of a FHIR-CC with choice of category and self-written subject heading

This action describes the sending of a FHIR-CC, where the user both chooses a category and a self-written subject heading.

3.1	**Category and self-written subject heading**
Actions	• User: Chooses a category from the category list • User: Chooses a subject heading • System: Shows category and subject heading to user • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number

3.2 Sending of a FHIR-CC with choice of category only

This action describes the sending of a FHIR-CC, where the user only chooses category.

3.2	**Only category**
Actions	• User: Chooses a category from the category list • System: Shows category to user • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number

3.3 Answering of a FHIR-CC

This action describes the answering of a FHIR-CC, where the system automatically inserts a category and subject heading from the received care communication.

3.3	**Answering of FHIR-CC**
Actions	• System: Automatically inserts the same category and subject heading when a FHIR-CC is answered • System: Shows category and subject heading to user • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number

3.4 Forwarding of a FHIR-CC

This action describes the forwarding of a FHIR-CC, where the system automatically inserts a category and subject heading from the received FHIR-CC.

3.4	**Forwarding of FHIR-CC**
Actions	• System: Automatically inserts the same category and subject heading when a FHIR-CC is forwarded • System: Shows category and subject heading to user • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number

4 Optional general use case actions for test and implementation

4.1 Sending of a FHIR-CC with choice of predefined subject heading and automatically filled in category (mapping is a prerequisite)

This action describes the sending of a FHIR-CC, where the user chooses between the predefined subject heading that has been agreed in a cooperation agreement between the region and municipalities. After the user has selected a predefined subject heading, the system automatically assigns the relevant category. A prerequisite for this is, however, that mapping has already been made between the national categories and the predefined subject headings.

4.1	**Mapping between category and predefined subject heading**
Actions	• User: Chooses a predefined subject heading • System: Inserts the relevant category • System: Shows category and subject heading to user • User: Writes the message text • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number

4.2 Forwarding of FHIR-CC with stated reason for forwarding in a separate space

This action describes the forwarding of a FHIR-CC, where the system automatically inserts the category and subject heading from the received FHIR-CC, and where the reason for forwarding is specified in a separate space.

4.2	**Forwarding of FHIR-CC with stated reason for forwarding**
Actions	• System: Automatically inserts the same category and subject heading when a FHIR-CC is forwarded • System: Shows category and subject heading to user • User: Writes the reason for forwarding in one space • User: Chooses to send FHIR-CC • System: Automatically inserts the user as author with date and time, name, title and telephone number