

# Exploring the Possibilities of Completing a Material Flow Analysis of plastics and textiles in Danish Hospitals

– A Knowledge Gap Analysis

## CircleHealth



**nnovationsfonden**



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# Indholdsfortegnelse

1.	Introduction .....	4
1.1	Aim.....	5
1.2	Report structure .....	5
2.	State of the art of MFA and hospital's use of plastic and textiles .....	7
2.1	Identified hotspots in an intensive care unit in the Netherlands .....	7
2.2	Single-use medical plastics in a surgical hospital in Germany .....	8
2.3	Assessing the circularity and technological maturity of plastic waste management strategies in hospitals .....	12
2.4	Lessons learned and data input needs .....	13
3.	Data input made available by Holbæk Sygehus, Denmark .....	14
4.	Approach by Ivanović et al. (2022) applied on data from Holbæk Sygehus.....	15
4.1	Step 1: Eliminations of products outside research scope.....	15
4.2	Step 2: Eliminations of products with less than 5000 pieces used annually.....	15
5.	Hotspots .....	17
5.1	Non-sterile gloves .....	17
5.2	Isolation gowns .....	18
5.3	Hospital bed sheets.....	19
5.4	Peel packs .....	19
5.5	Patient lift slings .....	19
5.6	Plastic containers .....	19
6.	Conclusion .....	20
7.	References.....	22
8.	Appendix A: System definition .....	23
8.1	Departments and units.....	23
8.2	Product categories .....	26

# 1. Introduction

Plastics, characterized by their functional versatility and lightweight attributes, have seamlessly integrated into the fabric of modern healthcare, permeating a wide spectrum of activities (Joseph et al. 2021). While healthcare encompasses multifarious establishments, hospitals stand as substantial resource consumers due to their constant interplay of diagnostics, treatment procedures, and inpatient care (Joseph et al. 2021; Sastri 2014). In recent years, hospitals have markedly augmented their reliance on diverse plastic products, spanning both medical and auxiliary functions, underscoring the omnipresence of plastics within hospital operations (Joseph et al. 2021; Sastri 2014).

Medical plastic applications encompass critical facets such as medical devices (MD) and personal protective equipment (PPE) deployed across care settings like ambulatory care, operating theatres, and emergency rooms. Beyond medical contexts, plastics extend their influence on non-medical realms, including kitchens, cafeterias, cleaning, and maintenance. These plastic products, classified as either durable or disposable, engender distinct lifecycles. Durables, marked by extended usage spans, often span over three to five years, whereas disposables, designed for single use, have surged in adoption.

While the European Union (EU) has aptly directed efforts towards curbing non-medical single-use plastics, a parallel shift in medical consumables is lagging, with limited research on usage reduction strategies. Medical consumables predominantly consist of commodity polymers, with prevalent plastics like polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), and polystyrene (PS) accounting for the bulk of medical device mass. Strikingly, PPE, an indispensable shield in healthcare, emerges as a considerable contributor, with around half of its composition being plastic-based.

## **1.1 Aim**

To understand where in the Danish hospital's consumption of plastic and textiles the greatest potential for impact is (i.e., reduce CO<sub>2</sub> consumption), it is vital to obtain a detailed understanding of the material flow within the hospital.

Analyzing the mass flow of plastics in a hospital requires insight into how plastics are used and managed within the healthcare sector in general and a given hospital in specific. In order to complete a mass flow analysis of the use of plastics in a given hospital, one would need information and data on e.g.,

1. Procurement information including product name, producer, number of units within each product and number of products bought per year.
2. Types and quantities of plastics within each product bought with regard to types such as polypropylene, polyethylene, PVC, etc. and quantities of single-use plastics (e.g., disposable gloves, syringes, packaging materials) and durable plastics (e.g., equipment, furniture).
3. Packaging data and details about the packaging materials used for medical supplies and equipment including types and quantities of packaging materials and their disposal methods.
4. Usage information with regard to how and where plastics are used within the hospital such as operating rooms, patient rooms, laboratories.
5. Waste generation and disposal related to how plastic waste is managed within the hospital e.g., waste collection, separation, reused, recycling, disposal methods and whether the waste is expected to go to incineration, landfill or a recycling facility.

Data on Material flow analysis (MFA) in the healthcare sector is scarce and only a few studies investigating the flows of plastics and other environmental hotspots have been published.

## **1.2 Report structure**

First the current state of knowledge with regard to MFA and hospital's consumption of plastics and textiles is reviewed and summarized in chapter 2 of this report. The relevance of the current state of knowledge is discussed up against the current situation, Region Sjælland (chapter 3). Based on a current

state of knowledge and the input data and information that we have access to, the possibilities of using the approach suggested by Ivanović et al (2022) was explored (chapter 5). In chapter 6, we will analyse the literature with regard to five selected product categories, namely non-sterile gloves, isotherm gowns, bed lines, peel packs, patients lift slings and plastic containers. Finally in chapter 7, we compare the information that one would need in order to complete an MFA for these different product categories up against the information that we have been able to identify in the literature.

## 2. State of the art of MFA and hospital's use of plastic and textiles

A literature search on Web of Science and Google Scholars reveals that only very few studies exist of relevance to MFA and hospital's consumption of plastics and textiles. Using keywords such as mass flow analysis, mass flow mapping in combination with hospital\* and health care, we only identified a handful of studies of relevance. These are reviewed below.

### **2.1 Identified hotspots in an intensive care unit in the Netherlands**

In 2023, a study by Hunfeld et al. conducted a Material Flow Analysis (MFA) to assess the environmental impact of materials used in an intensive care unit (ICU) of a hospital. The MFA aimed to provide insights into the inflow and outflow of materials, as well as their environmental implications. The study analysed data from the ICU for the year 2019, including 2,839 patients admitted for a total of 13,059 patient days. The MFA focused on the material consumption of the ICU and the data collection included all materials entering and leaving the ICU in 2019. All products were assigned to product groups with a coverage of 92.7%, based on the amount. Missing weights and material compositions in the reports were addressed through desk research, including suppliers' websites and product brochures, as well as by physically measuring the weights of products without available information.

The findings revealed that a total of 247,000 kg of materials were used in the ICU during the study period. The largest proportion of the mass was attributed to sterile water, primarily used in liquid medicines like infusion and dialysis fluids. Medicines accounted for a significant portion of the mass, followed by synthetic plastics and rubbers, synthetic fabrics, glass, biobased materials, chemicals, and metals.

Based on the significant embodied impact and frequency of use, the study identified five single-use products were identified as key environmental hotspots within the ICU, including:

- Non-sterile gloves

- Isolation gowns
- Bed liners
- Surgical masks and
- Syringes (including packaging)

These products were found to have a significant environmental impact in terms of weight, carbon footprint, agricultural land occupation, and water usage.

The environmental impact per ICU patient per day was estimated to be 17 kg of mass, 12 kg CO<sub>2</sub> equivalent, 300 litres of water usage, and 4 square meters of agricultural land occupation. It was noted that around 50,000 kg of waste materials, including hazardous waste, were incinerated. Recycling was limited primarily to glass.

## **2.2 Single-use medical plastics in a surgical hospital in Germany**

In another study, Ivanović et al (2022) conducted a comprehensive MFA of single-use medical plastics in a German hospital, focusing on different polymer types and their prevalence within consumables. The consumption and procurement data for diverse medical and nonmedical products and services for the hospital and its subsidiaries were obtained for two consecutive years (2018 and 2019). The originally provided datasets consisted of 8637 and 8659 different products procured and used in 2018 and 2019, respectively. The products were categorized in relevant units (1 piece, 1 pair, 1 roll or 1 primary packaging). As the dataset in the study was very comprehensive and the authors used a step-by-step procedure to filter out the most relevant data and products (see figure 1).



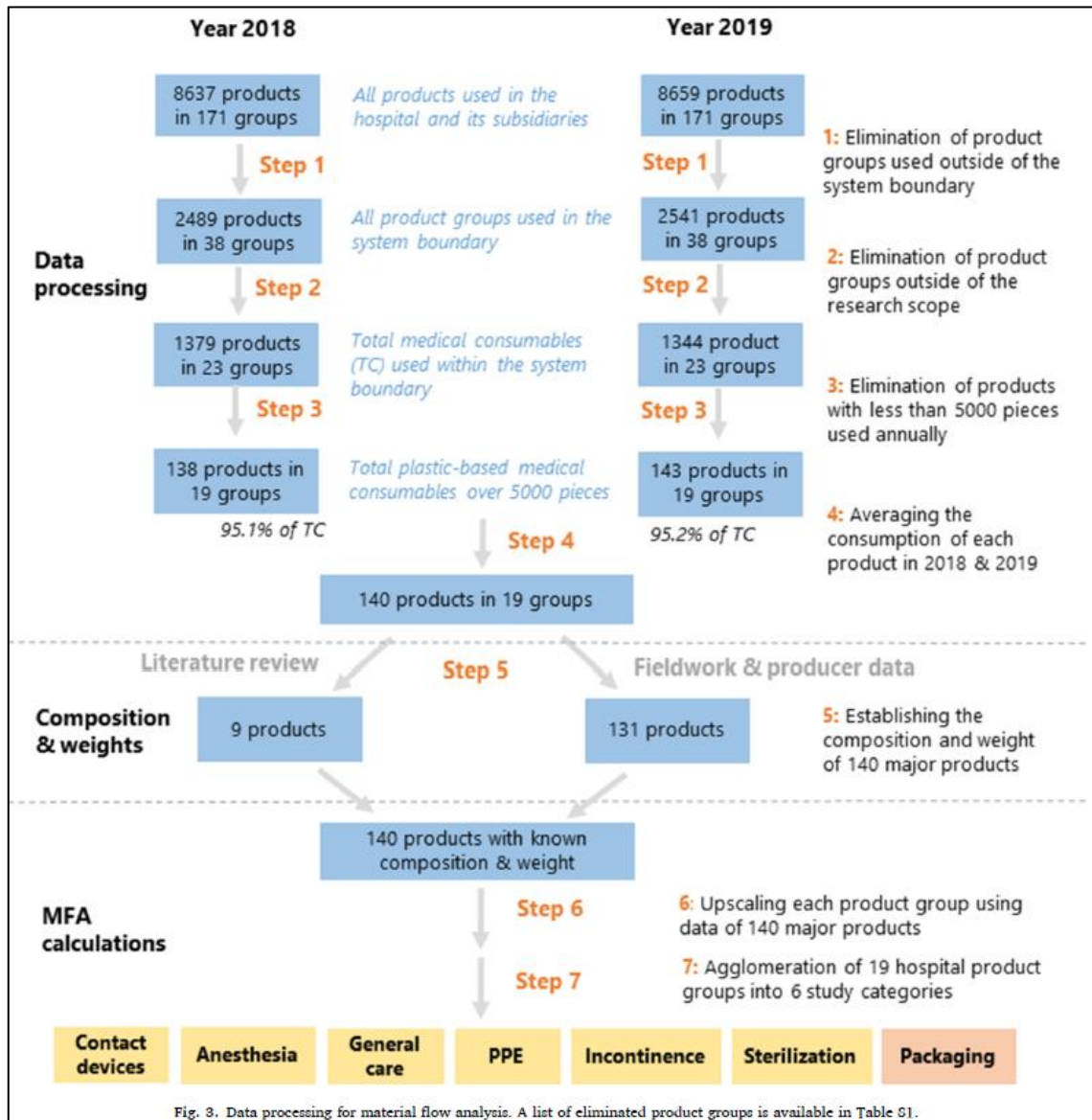


Figure 1: Data processing for MFA (From Ivanović et al 2022).

In their study, Ivanović et al (2022) used a 4-step approach:

Step 1: Elimination of product groups used outside of the system boundary. The system boundary was defined as the surgical hospital BG Klinikum Bergmannstrost in Halle, Germany. Within this boundary, consideration was given to the hospital's routine medical activities, encompassing emergency room procedures, surgical interventions, patient care units (including intensive care facilities), ambulatory services, and the sterilization of reusable medical apparatus. Notably, the scope excluded the clinic's provision of home

care and the hospital's auxiliary functions such as maintenance, administration, and food services.

Step 2: Elimination of product groups outside the research scope. To define the research scope, the authors came up with the below figure, categorizing the plastic products procured for the hospital in one of four categories: a) Non-medical consumables, b) Medical consumables, c) Non-medical durables and d) Non-medical durables, where the research scope was b) medical consumables (see figure 2).



Figure 2. Categorization of plastic products according to Ivanović et al. (2022)

Step 3: Elimination of products with less than 5000pieces used annually. Based on the procurement data, products with less consumption could be eliminated.

Step 4: Averaging consumption over the two years: irrelevant for this report.

By following the steps, six major product categories were identified – see table 1.

Table 1		Examples of products
Definition of eight product categories and a non-exhaustive list of examples of belonging products.		
Product category		
Contact devices		infusion sets; syringes; intravenous & butterfly needles coupled with blood taking equipment; regular and special urinary catheters; drainage & postoperative suction
Anesthesia		anesthesia masks for patients
General care		medication dispensers; washing gloves & hygiene items; razors; swabs; medical bags
PPE	Gloves	single-use examination gloves; surgical gloves
	Surgical textiles	protective textiles for patients and sterile equipment in surgery
	Face & body protection	surgical masks; caps; aprons; single-use coats
Incontinence		adult diapers; female sanitary products; single-use protective bed sheet
Sterilization		bags for in-house sterilized goods; container closers

Table 1: Definition of eight product categories, etc. (From Ivanović et al 2022)

The study revealed that hospitals utilize a significant number of plastic-based consumables, with an average consumption rate of 619 g per patient per day. Polymer streams, including PP, PET, PE, PS, PU, PVC, rubber (incl. latex), and minor streams, accounted for 531 g per patient per day.

Among the analysed product categories, personal protective equipment (PPE) and incontinence products emerged as the major contributors to the total mass of consumables. PPE alone represented 49% of the consumables' mass, with non-woven polypropylene and latex being the dominant materials. Furthermore, face and body protection (surgical masks, FFP2 masks, aprons, coats, and caps) as a standalone sub-category, were the most used form of consumables while gloves were the most important consumable in the total plastic consumption, as they are made of 100% plastic. Given the prominence of PPE, reducing its consumption emerged as a crucial focus for plastic reduction efforts in medical institutions.

The second highest consumption rate was incontinence products, followed by contact devices.

Additionally, the complexity and heterogeneity of medical devices, particularly contact devices, posed challenges to recycling efforts. While recyclable, non-contaminated fractions of medical waste were typically incinerated due to ease of management and risk perception, further work would be required to address these issues. The intricate nature of medical products and the perceived risks associated with them often favour energy recovery over material recovery.

### **2.3 Assessing the circularity and technological maturity of plastic waste management strategies in hospitals**

In a third study of relevance to the scope of CircleHealth, Fletcher et al., 2021 examined waste management strategies in hospitals, with a specific focus on single-use plastics. The authors reviewed existing evidence, and developed a framework called the 'Waste Hierarchy-Technology Readiness Levels' to assess the strategies. The maturity of the technology, the position in the Waste Hierarchy, and adherence to circular economy principles were evaluated. The dominant strategies currently used in hospitals included landfill disposal, incineration, and recycling, while alternative strategies encompassed reduction, reuse, bioremediation, and chemical recycling. Most of the reviewed strategies were technologically mature but positioned at lower levels of the Waste Hierarchy, indicating a need for more innovative, circular economy solutions. Notable exceptions were bioremediation using microbial action and chemical recycling using hydrophilic solvents, which are higher on the Waste Hierarchy but in early stages of development. The review also highlighted disparities in circular economy alignment between waste management strategies in developed and developing nations, which emphasized the importance of international collaboration and region-specific strategies.

Additionally, the study uncovered the range of plastic products commonly utilized and discarded by hospitals. Among the reviewed literature, blue wrap and packaging were the most frequently mentioned plastic products, followed by generic plastic items, plastic tubing, bottles, and syringes. These findings partially aligned with estimates from UK hospitals, which highlight the prominence of single-use theatre protective clothing, gloves, and disposable

wipes. However, the emphasis on gloves and disposable wipes in the NHS-England data was not as strongly reflected in the literature sample.

The comprehensive analysis of waste management strategies and plastic product usage in hospitals provided insights into the current state of single-use plastics in healthcare settings. The results underscored the need for more innovative and circular economy-driven approaches to waste management in hospitals, particularly in reducing reliance on landfill disposal and incineration. Collaborative efforts at the international level and context-specific strategies are vital for advancing sustainable practices in healthcare waste management and transitioning toward a more circular healthcare system.

#### **2.4 Lessons learned and data input needs**

From the literature review, it is clear that only a few studies have been performed of relevance to Circlehealth. In order to complete the MFA that was performed, Hunfeld et al. (2023) used a total of 8 data inputs, namely supplier name, product name, product category, packaging configuration, number of packages ordered, and number of units ordered and weights and material compositions of the products. Ivanović et al (2022) had access to 7 similar data inputs: Product procured, hospital's article number and article description supplier's article number; annual consumption in relevant units (1 piece, 1 pair, 1 roll or 1 primary packaging), waste management data and weigh and composition of products. Finally, Flethcer et al. (2022) combined data inputs on generation of plastic waste in hospitals, waste management practices, and waste policies by nation.

Based on a current state of knowledge and the input data and information that we have it seems most relevant to use the approach suggested by Ivanović et al (2022).

### 3. Data input made available by Holbæk Sygehus, Denmark

Holbæk Sygehus, Denmark is part of Region Zealand and contains 13 departments. Holbæk Sygehus contains 340 beds and has annually about 185.000 ambulant visits, 21.000 emergency room visits, 1.500 births and 12.000 surgical operations (Holbæk Sygehus, 2023).

The consumption and procurement data for all medical and nonmedical products for the hospital and its subsidiaries were provided to us by Holbæk Sygehus for the full year of 2020. The study is thus influenced by the impact of the Covid-19 pandemic. The original dataset contained a total of 127.203 purchases of 15.526.542 products (within a range of 10.858 distinct products based on product ID) utilized throughout 2020. Each entry provided the subsequent details: the hospital's article number and description; the relevant department and unit; product categories across four hierarchical levels as per the hospital's procurement classification; supplier information and supplier's article number and annual consumption in relevant units (1 piece, 1 pair, 1 carton, 1 primary packaging) (see table 1).

## 4. Approach by Ivanović et al. (2022) applied on data from Holbæk Sygehus

Since the study focuses on plastics and textile consumables, a step-by-step approach inspired by Ivanovic *et al.* (2022) was used to filter out the most relevant data and products.

The system boundary considers all regular activities of Holbæk Sygehus from medical operations, i.e., work in emergency rooms, operating theatres, ambulatory care, support services such as maintenance, food provision and administration.

### 4.1 Step 1: Eliminations of products outside research scope

Overall, the data from Hobæk Sygehus contained 15.526.542 products in 193 product groups (Product category level 2), see appendix. Each of the 193 product groups were evaluated to eliminate products outside the research scope (i.e., products that was either durable, non-plastic or non-textile based). After the elimination of products outside the research scope, the dataset contained 14.033.861 products in 49 product categories.

### 4.2 Step 2: Eliminations of products with less than 5000 pieces used annually

Similar to Ivanovic *et al.* (2022), we eliminated products categories with less than 5000 units used annually from the dataset, in order to identify the product groups with the highest consumption. After the elimination of products outside the research scope, we ended up having a total of 30 products categories including a total of 14.019.889 relevant products. It is important to notice that the information made available to us does not include data on how many individual items or pieces e.g., gloves, gowns and alike are included in each product. Furthermore, the data on the purchases are described in different units. For instance, if we look at single-use gloves, the dataset contains 5,838 purchases of 140,502 units. The unit types include several different units, varying from single gloves, to pairs and cartons/packages of unknown size. If we ignore the different unit types, we would get a result of 140,502 gloves

purchased in 2020. However, if we use a converting factor of 2 for pairs of gloves and of 100 for carton/packages (i.e., assuming 100 gloves per unit), 2,706,565 gloves are actually purchased in 2020. The varying unit types thus have a substantial influence on the amounts of purchased products, and this factor cannot be ignored. At the same time, the dataset contains more than 127,203 purchases and going manually through each product trying to get data on amounts per carton/package would not be an option. On the other hand, ignoring the unit types would not bring any value to the study.



## 5. Hotspots

It is not possible to complete an MFA using the data from Holbæk Sygehus at this point in time. Another way to approach the data would be to pinpoint specific product groups for deeper investigation e.g., Hunfeld et al. (2022) identified 6 environmental hotspots within an intensive care unit. Based on a discussion within the project group of Circlehealth, we decide to analyse the literature with regard to six selected product categories, namely non-sterile gloves, isotherm gowns, bed lines, peel packs, patients lift slings and plastic containers.

### 5.1 Non-sterile gloves

A search on non-sterile gloves in the "UNSPSC beskrivelse" of the dataset from Holbæk Sygehus results in 5.838 purchases of 140.502 units (see table 2).

Table 2: Non-sterile gloves in the "UNSPSC beskrivelse" of the dataset from Holbæk Sygehus results. PR is assumed to mean pair; pk is assumed to mean package but size of package is unknown

Antal varekøb	Antal enheder	Enhed	Betydning	Koverteringsfaktor	Summeret
2	2	BE	Ukendt	1	2
1	1	CT	Carton	100	100
28	3673	EA	Each, stk	1	3673
12	125	PR	par	2	250
2644	26690	pk	pakke	100	2669000
602	15100	set		2	30200
445	3340	stk		1	3340
<b>Total</b>					<b>2,706,565</b>

Most non-sterile gloves are made from either latex, nitrile, vinyl, or other polymers and raw materials include among other rubber latex, petrochemicals for synthetic gloves and plasticizers. Gloves are often packed in boxes or bags made of cardboard, plastic, or other materials and can

consequently be transported various retailers and distributors by various form of transportation. After use, the gloves are discarded in landfills, incinerations plants, or in some cases, recycled depending on the types of gloves as well as the waste management system in the country in which the hospital lies (Lovato et al. 2023; Jamal et al. 2021). In the UK, 1.4 billion gloves are used across the National Health Service each year (GOSH 2019) and globally, more than 150 billion pairs of gloves are produced each year (Jamal et al. 2021). It has been estimated that rubber gloves account for 24% of total medical solid waste (Lovato et al. 2023) and as latex gloves have been designed for single use, their disposal has been recognized as a worldwide solid waste problem (Rahman et al. 2019). Discarded natural rubber gloves typically take at least two years to degrade in a natural environment. There is an ongoing effort to educate hospital staff about the need to wear non-sterile gloves only when coming into contact with e.g., bodily fluids, non-intact skin and this effort has reduced plastics by 21 tonnes in the UK (GOSH 2019, NHS England 2023). There are furthermore, efforts underway to explore how e.g., the addition of starch into natural rubber latex compounds can accelerate the degradation process of the end products including gloves as an alternative to reduce solid waste disposal problem.

## **5.2 Isolation gowns**

A search on isolation gowns in the "UNSPSC beskrivelse" of the dataset from Holbæk Sygehus results in 728 purchases of 140.624 units. Disposable gowns typically compose of nonwoven polypropylene fabric and although the weight of a specific gown depend on type and manufacturers, a weight of 16 different disposable gowns has been reported to vary between 41 g and 91 g with an average of 63 g. In comparison a reusable gown weights 240 g (Wozzola et al. 2018). In a life cycle assessment of disposable and reusable gowns, Wozzola et al. (2018) found that the use of reusable gowns resulted in a 28% reduction in energy consumption, a 30% reduction in global warming potential, a 41% reduction in water consumption, and a 93%-99% reduction in solid waste generation at the healthcare facility compared to disposable gowns.

### 5.3 Hospital bed sheets

A search on hospital bed sheets in the "UNSPSC beskrivelse" of the dataset from Holbæk Sygehus results in 852 purchases of 145.105 units (see table 3).

Table 3: Hospital bed sheets in the "UNSPSC beskrivelse" of the dataset from Holbæk Sygehus

Antal varekøb	Antal enheder	Enhed	Betydning	Koverteringsfaktor	Summeret
1	3	CT	Carton	100	300
4	350	EA	Each, stk	1	350
75	131	ks	Kasse	100	13,100
5	21	pk	Pakke	100	2,100
766	144600	stk	Styk	1	144,600
<b>Total</b>					<b>160,450</b>

Besides the information that hospital bed sheets can be made of 100 % woven polyester, no other information has been found in the scientific literature on hospital bed sheets.

### 5.4 Peel packs

No information has been found in the scientific literature on peel packs.

### 5.5 Patient lift slings

No information has been found in the scientific literature on patient lift slings.

### 5.6 Plastic containers

No information has been found in the scientific literature on plastics containers used in hospitals.

## 6. Conclusion

The aim of this work was to explore the possibilities of complete an MFA of plastics and textiles in Danish hospitals. Examples of MFA in different hospital units are available in the literature, but it is not possible at this point in time to complete an MFA in Danish hospitals (see table 4).

*Table 4: Overview of data input needed in order to complete an MFA versus information currently available in the literature and open sources.*

<b>Data input needed</b>	<b>Non-sterile gloves</b>	<b>Isolation gowns</b>	<b>Hospital bed sheets</b>	<b>Peel packs</b>	<b>Lift slings</b>	<b>Plastic containers</b>
1. Procurement information	2,706,565 units	140,624 units	160,450 units	N.A.	N.A.	N.A.
2. Types and quantities of plastics	Natural or synthetic rubber	41-91 g nonwoven PP	100 % woven PET	N.A.	N.A.	N.A.
3. Packaging data	Cardboard, plastics	N.A.	N.A.	N.A.	N.A.	N.A.
4. Usage information	150 billion pairs of gloves are produced each year	N.A.	N.A.	N.A.	N.A.	N.A.
5. Waste generation and disposal	Landfills, incinerations plants, or in some cases, recycled	N.A.	N.A.	N.A.	N.A.	N.A.

In general, the information in the following table that would be needed in order to enable an MFA to be generated in the future.

Table 5: Overview of the information needed in order to enable an MFA to be generated in the future.

<b>1. Procurement information</b>				
1a. Product name(s)	Product A	Product B	Product C	...
1b. Producer				
1c. Number of units				
1d. Products bought per year				
<b>2. Types and quantities</b>				
2a. Plastic type for each product				
2b. Mass of each plastic type for each product				
<b>3. Packaging data</b>				
3a. Plastic type for each product				
3b. Mass of each plastic type for each product				
3c. Disposal methods for each product				
<b>4. Usage information</b>				
4a. Where is each product used within the hospital				
4b. How is the product used within the hospital				
<b>5. Waste generation and disposal</b>				
Mass of product that is collected				
% of product that is reused, recycled or disposed of				
Disposal method				

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## 8. Appendix A: System definition

### 8.1 Departments and units

Departments and units included in the system definition of this report are described in Table A.1 below. The first column describes the organizational levels, where the green rows are department levels and the rest is units within the department. The second column is the number of purchased units, while the third marks whether the organizational unit is within the system boundaries.

Table A.1: Overview of organizational levels, number of purchased units and whether the organizational unit is within the system boundaries

Organisationsniveau 3 + 4	Total Number of Units	Within system boundaries?
<b>Administrationen Holbæk Sygehus (13.034.137)</b>	<b>20930,0313</b>	
Fælles Administrationen Holbæk (1013012931841)	6375	No
Fælles HR og arbejdsmiljø administration Holbæk (1013012931845)	173,0002	No
Fælles Kvalitet administration Holbæk (1013012931842)	1	No
Fælles Sekretariatet administration Holbæk (1013012931843)	14369,0311	No
Fælles Økonomi og planlægning administration Holbæk (1013012931844)	12	No
<b>Akutafdeling Holbæk (13.034.138)</b>	<b>1210195,024</b>	
Fællesafsnit Akutafdeling Holbæk (1013012621140)	1210195,024	Yes
<b>Anæstesiologisk afdeling Holbæk (13.034.139)</b>	<b>1377834,464</b>	
Anæstesi afsnit Holbæk (1013010031033)	310298,0059	Yes
Fællesafsnit Anæstesi Holbæk (1013010031030)	3130,0008	Yes
Intensiv afsnit anæstesi Holbæk (1013010031034)	594323,0065	Yes
Operationsafsnit anæstesi Holbæk (1013010031037)	279079,4114	Yes
Sterilcentral anæstesi Holbæk (1013010031036)	179214,0041	Yes
Tværfagligt smertecenter (1013010031035)	11790,0357	Yes
<b>Arbejdsmedicinsk afdeling (13.034.140)</b>	<b>131425,0034</b>	
Afdelingsledelsen Arbejdsmedicinsk Afdeling i Region Sjælland (1013014097220)	196	No
Arbejdsmedicinsk afsnit Holbæk (1013014097222)	22147,0026	Yes
Arbejdsmedicinsk afsnit Nykøbing F. (1013014097223)	74	Yes
Podestation Covid-19 (1013014097226)	109008,0008	Yes
<b>Driftsafdelingen Holbæk Sygehus (13.034.141)</b>	<b>531697,2266</b>	
Centraldepot, Holbæk (1013012781805)	1040	No
Forsyning (1013012781820)		No
Fælles uanset matrikel driftsafdelingen Holbæk (1013012781801)	352670,0806	No
Information/reception driftsafdelingen Holbæk (1013012781807)	11794,0015	No
Kørselsområdet Holbæk (1013012781818)	684,0326	No
Lægecenter Kalundborg, driftsafdelingen Holbæk (1013012781813)	40	No
Portør logistik (tidligere 3742) (1013012781828)	10013,0576	No

Psykiatrihus Kalundborg (1013012781819)	4	No
Rengøring (tidligere 3741) (1013012781827)	86418,51	No
Serviafdelingen køkken (1013012781821)	6	No
Serviceafdelingen generelt (tidligere 0000) (1013012781826)	379	No
Sundheds- og akuthus Kalundborg, driftsafdelingen Holbæk (1013012781814)	5	No
Særlig vedligeholdelse driftsafdelingen Holbæk (1013012781810)	1263	No
Teknisk afdeling driftsafdelingen Holbæk (1013012781804)	66883,8237	No
Teknisk afdeling Kalundborg, driftsafdelingen Holbæk (1013012781812)	411	No
Udvendig vedligeholdelse driftsafdelingen Holbæk (1013012781811)	85,7206	No
<b>Fysio- og Ergoterapiafdelingen Holbæk (13.034.142)</b>	<b>44333,112</b>	
Fysio- og Ergoterapi Holbæk (1013011621403)	44329,112	Yes
Fælles Fysio- og Ergoterapiafd. Holbæk (1013011621404)	4	Yes
<b>Fælles drift Holbæk Sygehus (13.034.143)</b>	<b>14159,0026</b>	
Fælles drift Holbæk (1013018021892)	136	Yes
Fælles drift uanset matrikel Holbæk Sygehus (1013018021891)	14023,0026	Yes
<b>Gynækologisk/Obstetrisk afdeling Holbæk (13.034.144)</b>	<b>363258,2864</b>	
Fælles Kirurgisk afdeling Holbæk (1013010621070)	0	Yes
Fællesafsnit Gyn/obs. Holbæk (1013010621166)	5226,002	Yes
Fødeafsnit Gyn/obs. Afdeling G 1 Holbæk (1013010621177)	291127,9929	Yes
Gynækologisk Amb. Holbæk (1013010621169)	40251,0069	Yes
Svangreambulatorium Gyn/obs. Holbæk (1013010621172)	26653,2846	Yes
<b>Holbæk Sygehus generelt (13.034.145)</b>	<b>30895,0018</b>	
Apparaturudvalg Holbæk (1013013121885)	277	No
Forskningens Hus (1013013121880)	4454,0016	No
Frivillige på Holbæk Sygehus Generelt (1013013121882)	503	No
Interne projekter Holbæk (1013013121874)	13,0001	No
Journalarkiv Holbæk (1013013121864)	150	No
Kvalitetsarbejde Holbæk (1013013121872)	1320	No
Lægeseekretærelever Holbæk (1013013121866)	15	No
Sikkerhedsorganisation Holbæk (1013013121873)	1	No
Sundhedsfagligt Læringscenter (1013013121886)	10287,0001	No
Sundhedsplatform, Generelt - Holbæk (1013013121881)	18	No
Sygehusledelse Holbæk Sygehus (1013013121862)	80	No
Trykafastende madrasser Holbæk (1013013121876)	13777	No
<b>Ingen afdeling (13.034.146)</b>	<b>199,4</b>	
Anlæg: Holbæk fase 1. Bygning 42 (senge og enestuer) (1013000008215)	55	No
Intet afsnit (1013000000000)	144,4	No
<b>Kirurgisk afdeling Holbæk (13.034.147)</b>	<b>1024194,113</b>	
Endoskopiafsnit (1013010111077)	257882,0058	Yes
Fælles Kirurgisk afdeling Holbæk (1013010111070)	625931,7681	Yes



Gastroent.afsnit Kirurgi Holbæk (1013010111073)	140880,3391	Yes
Kirurgisk ambulatorium Holbæk (1013010111074)	-500	Yes
<b>Klinisk biokemisk afdeling Holbæk/Kalundborg (13.034.148)</b>	<b>3587754,856</b>	
Apparaturudvalg Holbæk (1013012231885)	18,1259	Yes
Fælles Klinisk Biokemi Holbæk (1013012231487)	2869934,721	Yes
Intet afsnit (1013012230000)	5	Yes
Klinisk Biokemi Kalundborg, Holbæk (1013012231490)	614198,0082	Yes
Klinisk Biokemisk afdeling Holbæk overf. (1013012231491)	1	Yes
Klinisk, Nykøbing Sj. Klinisk biokemi Holbæk (1013012231489)	103598,001	Yes
<b>Medicinsk afdeling Holbæk (13.034.151)</b>	<b>5622207,293</b>	
Dialyseafsnit 30-2 Medicinsk afd. Holbæk (1013011031293)	789835,5118	Yes
Dialysesatellitten Medicinsk afd. Slagelse (1013011031286)	465952,0044	Yes
Endokrinologisk ambulatorium medicinsk afd. Holbæk (1013011031291)	5568	Yes
Fællesafsnit Medicinsk afd. Holbæk (1013011031285)	168638,5031	Yes
Gastroenterologisk ambulatorium Medicinsk afd. Holbæk (1013011031304)	38884,0109	Yes
Gastroenterologisk sengeafsnit 04-4 Medicinsk afd. Holbæk (1013011031309)	502868,0013	Yes
Geriatrisk ambulatorium medicinsk afd. Holbæk (1013011031299)	23279,0022	Yes
Geriatrisk sengeafsnit 03-3 Medicinsk afd. Holbæk (1013011031295)	364619,0091	Yes
Geriatrisk sengeafsnit 03-4 Medicinsk afd. Holbæk (1013011031294)	361497,5027	Yes
Hjertemedicinsk ambulatorium Holbæk (1013011031289)	97448,0008	Yes
Hjertemedicinsk sengeafsnit 43-3 Holbæk (1013011031288)	476665,1015	Yes
Hjertemedicinsk sengeafsnit 43-4 Medicinsk afd. Holbæk (1013011031308)	445771,002	Yes
Internt medicinsk ambulatorium medicinsk afd. Holbæk (1013011031301)	50453,9649	Yes
Intet afsnit (1013011030000)	5,6364	Yes
IV-blandingsenhed (1013011037566)	137664,0012	Yes
Kardiologisk modtagelse 44-4 (1013011031311)	90500,0039	Yes
Lungemedicinsk ambulatorium Holbæk (1013011031305)	5722	Yes
Lungemedicinsk sengeafsnit 09-3 medicinsk afd. Holbæk (1013011031303)	658566,9813	Yes
Nefrologisk ambulatorium medicinsk afd. Holbæk (1013011031292)	10242,0009	Yes
Nefrologisk sengeafsnit 03-5 Medicinsk afd. Holbæk (1013011031310)	397441,036	Yes
Nefrologisk/endokrinologisk sengeafsnit 04-5 Medicinsk afd. Holbæk (1013011031290)	458655,0032	Yes
Reumatologisk ambulatorium medicinsk afd. Holbæk (1013011031298)	71931,0153	Yes
<b>Ortopædkirurgisk afdeling Holbæk (13.034.152)</b>	<b>774949,6245</b>	
Fællesafsnit Ortopædkirurgisk afdeling Holbæk (1013010421120)	23115,1209	Yes
Intet afsnit (1013010420000)	1	Yes
O.Kir. Sengeafsnit/amb. A 2 Holbæk (1013010421122)	750960,5036	Yes

O.Kir.Ambulatorie (1013010421123)	873	Yes
<b>Pædiatrisk Afdeling Holbæk (13.034.153)</b>	<b>642216,5052</b>	
Børneambulatorium Holbæk (1013011421368)	28879,0073	Yes
Fællesafsnit Børneafdelingen Holbæk (1013011421362)	25960,989	Yes
Intet afsnit (1013011420000)	6560,0003	Yes
Neonatal Børneafdelingen Holbæk (1013011421366)	310156,0014	Yes
Pædiatrisk sengeafsnit D1, Holbæk (1013011421364)	270660,5072	Yes
<b>Radiologisk afdeling Holbæk/Kalundborg (13.034.154)</b>	<b>150293,0125</b>	
Fælles Radiologi Holbæk (1013012031456)	-406	Yes
Radiologi Holbæk (1013012031461)	135383,0119	Yes
Radiologi Kalundborg (1013012031458)	13415,0006	Yes
Satellit Radiologisk afd. Nykøbing Sj. Holbæk (1013012031457)	1901	Yes
<b>Grand Total</b>	<b>15526541,96</b>	

## 8.2 Product categories

### Varekategori 1 + 2

#### 1000000: Levende planter og animalsk materiale og tilbehør og forbrugstoffer

10160000: Blomsterbrug og skovbrugsprodukter

10170000: Gødning og plantenæringsstoffer og ukrudtsmidler

10190000: Produkter til skadedyrskontrol

10210000: Levende planter af ædel art eller varierende sjældenhed

10310000: Friske afskårne blomster af ædel art eller sjældenhed

10330000: Frisk afskårne krysantemum

10340000: Frisk afskårne blomsterbuketter

(blank)

#### 1100000: Mineral og tekstil og uspiselige planter og animalsk materiale

11110000: Jord og sten

11140000: Affald og skrot

11150000: Fibre, tråde og garn

11160000: Tekstiler og lædermaterialer

#### 1200000: Kemikalier, herunder bio-kemikalier og gas-materialer

12140000: Grundstoffer og gasser

12160000: Tilsætningsstoffer

12170000: Farvestoffer

12190000: Opløsningsmidler

12350000: Forbindelser og blandinger

#### 1300000: Resin og rosin og gummi og skum og film og elastomere materialer

13110000: Resiner og rosiner og andre resin-afledte materialer

#### 1400000: Papirmaterialer og produkter

14110000: Papirprodukter

14120000: Papir til industriel brug

**15000000: Brændsel, brændstof-tilsætningsstoffer, smøremidler og anti-korroderende materialer**

15100000: Brændstoffer

15110000: Gasformigt brændstof og additiv

15120000: Smøremidler og olier og fedt og anti korrosionsmidler

**20000000: Minedrift, brøndboring, maskiner og tilbehør**

20100000: Minedrift og stenbrud, maskiner og udstyr

**22000000: Entreprenørmaskiner og tilbehør**

(blank)

**23000000: Maskiner og tilbehør til industriel fremstilling og forarbejdning**

23180000: Føde- og drikkevarer, industriudstyr

23270000: Svejsning og lodning og slaglodning, maskiner og tilbehør og forsyninger

23290000: Industrielle værktøjsmaskiner

(blank)

**24000000: Materialehåndtering og behandling og opbevaring, maskiner og deres tilbehør og forbrugsstoffer**

24100000: Materialehåndtering, maskiner og udstyr

24110000: Beholdere og opbevaring

24120000: Emballagematerialer

24140000: Emballage, forbrugsmaterialer

(blank)

**25000000: Kommercielle og militære og private køretøjer samt deres tilbehør og komponenter**

25170000: Transport, komponenter og systemer

**26000000: Maskiner og tilbehør til produktion og distribution af elektricitet**

26100000: Strømkilder

26110000: Batterier og generatorer og kinetisk kraftoverføring

26120000: Elektriske ledninger og kabler og kabelføring

26130000: Elproduktion

**27000000: Værktøj og generelle maskiner**

27110000: Håndværktøj

27130000: Pneumatiske maskiner og udstyr

27150000: Reservedele, rengøringsmaskiner og tilbehør

(blank)

**30000000: Strukturer og bygning og konstruktion, produktionskomponenter og forbrugsstoffer**

30100000: Bygningskomponenter og standardelementer

30110000: Beton og cement og gips

30120000: Veje og landskab

30130000: Strukturelle byggeprodukter

30140000: Isolering

30150000: Udvendige finish-materialer

30160000: Indvendige finish-materialer

30170000: Døre og vinduer og glas

30180000: VVS-installationer

30190000: Konstruktion og vedligeholdelse, stilladsudstyr

30260000: Strukturelle materialer

(blank)

### **3100000: Produktionskomponenter og forbrugsstoffer**

31150000: Reb og kæde og kabel og wire og rem

31160000: Hardware

31170000: Lejer og lejevøsninger og hjul og tandhjul

31190000: Slibning og polering og udglatning, materialer

31200000: Lim- og fugemasser

31210000: Maling og grundere og lakker

31240000: Industriel optik

31400000: Pakninger til forsegling

(blank)

### **3200000: Elektroniske komponenter og forbrugsstoffer**

32110000: Diskrete halvlederkomponenter

32130000: Elektronisk hardware og komponentdele og tilbehør

(blank)

### **3900000: Elektriske systemer og belysning og komponenter og tilbehør og forbrugsstoffer**

39100000: Lamper og elpærer og lampekompneter

39110000: Lysarmaturer og tilbehør

39120000: Elektrisk udstyr og komponenter og forbrugsstoffer

39130000: Elektriske ledningsstyrings-enheder og tilbehør og forsyninger

(blank)

### **4000000: Distributions- og behandlingssystemer og udstyr og komponenter**

40100000: Varme- og ventilations- og luftcirkulering

40140000: Væske- og gasdistribution

40150000: Industrielle pumper og kompressorer

40160000: Industriel filtrering og rensning

40170000: Rør, rørføring og rørfittings

40180000: Slanger, og slangeføring og slangefittings

(blank)

### **4100000: Laboratorie- og måleudstyr til test og observation**

41100000: Laboratorie- og videnskabeligt udstyr

41110000: Instrumenter til måling, observation og afprøvning

41120000: Laboratorieforsyninger og inventar

(blank)

### **4200000: Medicinsk udstyr og tilbehør og forbrugsstoffer**

42120000: Veterinært udstyr og forbrugsstoffer

42130000: Medicinsk beklædning og tekstil

42140000: Patientpleje og -behandlingsprodukter og forbrugsstoffer

42150000: Dentalt udstyr og forbrugsstoffer

42160000: Dialyseudstyr og forbrugsartikler

42170000: Mobile medicinske produkter

42180000: Patientundersøgelses- og overvågningspudstyr

42190000: Produkter til medicinske institutioner

42200000: Medicinsk billediagnostik og strålemedicinske produkter

42210000: Uafhængige dagligdagshjælpermidler

42220000: Produkter til intravenøs og arteriel administration

42230000: Klinisk ernæring

42240000: Ortopædiske og proteser og sportsmedicinske produkter

42250000: Produkter til fysioterapi og ergoterapi og rehabilitering

42260000: Post mortem og lighus, udstyr og forbrugsstoffer

42270000: Respiratoriske og anæstesi- og genoplivningsprodukter

42280000: Medicinsk rengøring og sterilisation, produkter

42290000: Kirurgiske produkter

42300000: Medicinsk uddannelses- og træningsudstyr

42310000: Sårpleje-produkter

42320000: Ortopæd kirurgiske implantater

(blank)

### **43000000: Informationsteknologi og radio- eller telekommunikation**

43190000: Kommunikationsenheder og tilbehør

43200000: Komponenter til informationsteknologi eller radio- eller telekommunikation

43210000: Computerudstyr og tilbehør

43220000: Data, stemme eller multimedienetværk udstyr eller platforme og tilbehør

43230000: Software

(blank)

### **44000000: Kontorudstyr og tilbehør og forbrugsstoffer**

44100000: Kontormaskiner og deres forsyninger og tilbehør

44110000: Kontor- og skrivebordstilbehør

44120000: Kontorartikler

(blank)

### **45000000: Print- og fotografisk- og lyd- og visuelt udstyr og forbrugsstoffer**

45110000: Audio- og visuelt præsentations- og fremstillingsudstyr

45120000: Foto- eller film- eller videoudstyr

### **46000000: Forsvar og politi og sikkerhed og sikkerhedsudstyr og forbrugsstoffer**

46150000: Retshåndhævelse

46160000: Offentlig sikkerhed og kontrol

46170000: Sikkerhedsovervågning og detektering

46180000: Personlig sikkerhed og beskyttelse

46190000: Brandsikring

### **47000000: Rengøringsudstyr og forbrugsstoffer**

47100000: Vand og spildevandsbehandling, forsyning og bortskaffelse

47110000: Tøjrask og tekstilrens, industriudstyr

47120000: Viceværtsudstyr

47130000: Rengørings- og viceværtsforsyninger

(blank)

### **48000000: Serviceindustri, maskiner og udstyr og forbrugsstoffer**

48100000: Institutionelt cateringudstyr

### **49000000: Sports- og rekreativt udstyr og forbrugsstoffer og tilbehør**

49120000: Camping- og udendørs udstyr og tilbehør

49160000: Løbe- og banesportsudstyr

49200000: Fitnessudstyr

49220000: Sportsudstyr og tilbehør

49240000: Rekreative- og legeplads- og swimmingpool- og spaudstyr og forbrugsstoffer

(blank)

### **50000000: Mad-, drikke- og tobaksvare**

50100000: Nødder og frø

50110000: Kød og fjerkræ

50130000: Mejeriprodukter og æg

50150000: Spiselige olier og fedtstoffer

50160000: Chokolade og sukker og sødemidler og konditorvarer

50170000: Krydderier og konserveringsmidler

50180000: Brød og bagværk

50190000: Tilberedte og konserverede fødevarer

50200000: Drikkevarer

50210000: Tobaks- og rygeprodukter og erstatninger

50220000: Korn- og pulsprodukter

50300000: Frisk frugt

50310000: Økologisk frisk frugt

50320000: Tørret frugt

50400000: Friske grøntsager

50410000: Økologiske friske grøntsager

50440000: Frosne grøntsager

50460000: Grøntsager på dåse eller glas

50620000: Ikke-GMO frisk grøntsagspuré

(blank)

### **51000000: Drugs and Pharmaceutical Products**

51140000: Central nervous system drugs

51180000: Hormones and hormone antagonists

51240000: Drugs affecting the ears, eye, nose and skin

51270000: Anaesthetic drugs and related adjuncts and analeptics

51280000: Antibacterials

51380000: Nonsteroidal anti inflammatory drugs NSAIDs

51470000: Antiseptics

(blank)

### **52000000: Husholdningsapparater og forbrugsstoffer og forbrugerelektronik**

52100000: Gulvbelægninger

52120000: Sengetøj og bord og køkken, linned og håndklæder

52130000: Vinduesbehandlinger

52140000: Husholdningsapparater

52150000: Husholdningsapparater til køkken og køkkengrej

52160000: Forbrugerelektronik

52170000: Vægbehandlinger til hjemmebrug

(blank)

**53000000: Beklædning og bagage og produkter til personlig pleje**

53100000: Tøj

53110000: Fodtøj

53120000: Bagage og håndtasker og rygsække og kufferter

53130000: Produkter til personlig pleje

53140000: Sygrej og tilbehør

**54000000: Ure og smykker, og ædelsten**

54110000: bærbare og stationære ure

**55000000: Udgivne produkter**

55100000: Trykte medier

55110000: Elektronisk referencemateriale

55120000: Skiltning og tilbehør

(blank)

**56000000: Møbler og inventar**

56100000: Boligmøbler

56110000: Kommercielle og industrielle møbler

56120000: Klasseværelse- og undervisnings- og institutionelle møbler og inventar

56140000: Dekorativ pynt

(blank)

**60000000: Musikinstrumenter og spil og legetøj og kunsthåndværk og uddannelsesmæssigt udstyr og forbrugsstoffer**

60100000: Udviklingsmæssige og professionelle undervisningsmateriale og materialer og tilbehør og forbrugsstoffer

60120000: Kunsthåndværk, udstyr og tilbehør og forbrugsstoffer

60140000: Legetøj og spil

(blank)

**95000000: Jord og bygninger og anlæg og færdselsårer**

95130000: Mobile bygninger og strukturer

95140000: Præfabrikerede bygninger og strukturer