SIFO PROJECT NOTE

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CONSUMPTION RESEARCH NORWAY (SIFO)

Want Not, Waste Not: Preliminary findings

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Summary

This project note presents preliminary findings from a PhD project looking into textile waste from Norwegian households. 28 households collected textiles that they would have otherwise discarded for a period of six months. The textiles were collected by the PhD candidate during visits to the households where qualitative interviews were carried out. Then, all textiles were registered along with information from the interviews. The findings indicate that most of the discarded textiles are clothes and shoes. However, when broken down into textile categories, household textiles represent the largest group of discarded textiles. In addition, findings show that about one third of the collected textiles were in a very good condition, either like new or with only minor changes. The fiber content of the textiles corresponded with the preliminary findings from work package 2 in Wasted Textiles, as there was an equal distribution between 100% synthetic textiles, 100% non-synthetic textiles and textiles containing a mix of these. It was also found that the largest group of users were adult women, especially when looking at number of textiles discarded. If weight was applied instead, the difference between the genders evened out more. As these findings are preliminary, it is too early to provide any hard conclusions. Instead, the project note is meant to grant insights into the kind of data that will eventually be available and shared with the project group.

Keywords

Textile waste, clothing consumption, textile fibers, wardrobe studies

Preface

This report represents a project note based on a presentation by PhD candidate Anna Schytte Sigaard with preliminary findings to project partners of the Wasted Textiles project and other interested parties on the 14th of March 2023 at Oslo Metropolitan University (OsloMet). The Wasted Textiles project is led by Ingun Grimstad Klepp at Consumption Research Norway (SIFO).

The findings presented are based on fieldwork and data collection from the PhD-project "Want Not, Waste Not: A wardrobe study approach to minimizing textile waste from Norwegian households". The PhD-project started in August 2021 and will finish in August 2025. Therefore, the conclusive findings will be presented at a later stage.

Until the date for this publication, 2307 pieces with a total weight of 389.5 kg have been registered. It is expected that the total number of textile items will be around 3000. It has been decided that the preliminary findings are shared now, since the subsequent work packages of the Waste Textiles project are waiting for results to carry on with their tasks. The aim of this project note is, therefore, to grant insights into the data available in the PhD-project to interested parties and give an idea of the findings and knowledge that may come out of the project at a later stage.

Oslo, March 2023

Consumption Research Norway (SIFO)

OsloMet – Oslo Metropolitan University

Content

Introduction

In this chapter, the background for the data will be presented to make clear how and why it has been collected. First, the Wasted Textiles project and work package 1 of this project will be briefly described. Secondly, the Want Not, Waste Not PhD project will be described along with the recruitment, fieldwork and interview processes. Finally, challenges during the first three steps of the process will be discussed: for recruitment, during interviews and in registration of raw data.

1.1 Background: Wasted Textiles

The PhD-project is part of a larger research project entitled “Wasted Textiles: Reduced synthetic textile waste through the development of resource-efficient value chains”. This is a four-year project funded by the Norwegian Research Council and the Norwegian Retailers’ Environment Fund through the call entitled “Circular value chains for products containing plastic”. The project is led by Consumption Research Norway (SIFO) and has 10 main collaborating partners, both academic and non-academic: Mepex Consult AS, Norwegian Fashion and Textile Agenda (NF&TA), SINTEF, Waste Management Norway (WMN), Revaluate, NICE Fashion, Fretex Environment AS, The future in our hands (FIVH), the Norwegian Consumer Council, and Faculty for Technology, Art and Design (TKD) at OsloMet.

	Topic	**Leader**
WP1	Households	SIFO
WP2	Quantities	Mepex AS
WP3	Reduction and mitigation	NF&TA
WP4	Evaluating circular strategies	Sintef
WP5	Regulations	SIFO
WP6	Dissemination	NICE Fashion
WP7	Coordination	SIFO

Table 1: Work packages and work package leaders of the Wasted Textiles project.

The project is made up of seven work packages with each their own work packages leader and main topic (see table 1). The PhD-project makes up work package 1 – Households and is led by Kirsi Laitala at SIFO, who is also the main supervisor for the

PhD candidate. The description of work package 1 in the project description of the Wasted Textiles project is as follows:

> *Wardrobe studies with semi-structured interviews will map wasted textiles in 30 households over a period of six months. In wardrobe studies, the product's history, use, value, condition, and materials are subject to systematic analysis. Wardrobe studies have gained importance for clothing research internationally, and for studying other consumer products. The PhD candidate will conduct the fieldwork at locations suggested by our three collaborating municipal partners, the City of Oslo, VESAR (Vestfold) and IRIS Salten IKS (Nordland), which includes both rural and urban areas. The households will collect all textiles that would otherwise be thrown/given away, burned, or stored over time, in addition to an overview of the leaked textiles. We will then go through all the textiles and map their history of acquisition and use, fiber composition, reason for disposal and planned method of disposal. This will also include a technical testing of the fiber content using a new scanner based on near-infrared technology.*

The deliverables of the work package consist of four peer-reviewed scientific articles and report/communication of results to partners. Based on this description and the required deliverables, the PhD candidate developed the project "Want Not, Waste Not: A wardrobe study approach to minimizing textile waste from Norwegian households". The first article was published in the beginning of this year and looks at consumers' fiber preferences and perceptions of fiber sustainability (Sigaard & Laitala, 2023).

1.2 Background: Want Not, Waste Not

The PhD-project takes its point of departure from four research questions:

1. What do wasted textiles from Norwegian households consist of?
2. How and why is textile waste generated in the households?
3. How are textiles disposed of by the households?
4. What value do people attach to used textiles, and how does this affect textile waste?

The primary method for the project is wardrobe studies. The contribution of wardrobe studies in the effort to minimize textile waste is to create an understanding of the relationship between the individual clothing or textile item and the larger material context (Klepp & Bjerck, 2014) by exploring the interactions between people, textiles, and the world (Fletcher & Klepp, 2017). As it includes the technical characteristics of the textiles along with knowledge about the owner's social life, the method creates an understanding of how the material relates to practices and vice versa. In this way, it deals with the interconnectedness between how something is talked about and the material item itself (Hebrok & Heidenstrøm, 2019).

Wardrobe studies consist of four components: fieldwork, interviews, inventory and testing (Klepp & Bjerck, 2014). A wardrobe study interview differs from the classic social science interview in that it revolves around material objects, intended to remind the informant about specific events, emotions etc. A goal is to make the conversation between informants and interviewer less general and more concrete, involving

narratives about the garments. When informants handle the items during the interview, a dialogue is established that includes a sensory experience (Skjold, 2018). Wardrobe studies thereby allow the researcher and the informant to co-construct a lifecycle of each piece of clothing which can be compared to other pieces in the same wardrobe or to similar pieces across wardrobes (Klepp & Bjerck, 2014).

Recruiting and Participants

The first step in the fieldwork process consisted of recruiting participants who were willing to be part of the project for six months which is a bigger commitment than the usual research project participation. Municipal waste management partners in the Wasted Textiles project assisted in the recruiting process by posting information about the project on their webpages and through their social media channels. The partners were Oslo Municipality and the two intermunicipal waste management companies Vesar and Iris Salten. Almost 300 people signed up to participate through an online form. As part of the sign-up process, they were asked to answer questions related to demographic information and personal interest so that potential participants with different life situations and motivations for participating could be contacted. Many potential participants never responded after the initial contact and others withdrew their interest in participating as they felt the commitment was more than they could agree to.

Figure 1: A map of Norway where areas for fieldwork are marked.

Eventually, 30 household from three areas in Norway (see Figure 1) agreed to participate in the project and 28 of these completed the entire participation period of six months. Of the 28 participating households, 11 were living in Oslo, 9 in Vestfold and 8 in Salten. Initially, 10 households in each area had agreed to participate but one

household moved from Vestfold to Oslo during the participation period and two households in Salten discontinued their participation.

The 28 households consisted of men living alone (3), women living alone (4), couples living together (8) and families with children (13) (see Table 2). 14 of the households lived in apartments, 12 lived in houses and two lived on farms (see Table 3). Between the main participants in each household (the participants who signed up the household to the project), three had high school as their highest level of education, two had vocational or trade education, six had university or college of maximum three years and 17 had university or college level education of more than three years (see Table 4). Within the 28 households, a total of 73 people participated in the collection of textiles. Of these 73 people, 8 were small children, 12 were small children, 4 were youths, 24 were adult women and 25 were adult men (see Table 5). Some of the adult men and women were adult children still living at home. The income of the households has not been included. The reason for this is that this may be considered as very private and sensitive information by the potential information so in order to not discourage anyone from signing up, this question was left out.

Table 2: Overview of household type for particiating households.

Household type	
Man (single)	3
Woman (single)	4
Couple	8
Family	13
Total	28

Table 3: Overview of residence type for participating households.

Residence type	
Apartment	14
House	12
Farm	2
Total	28

Table 4: Overview of education level for the main participant of the households.

Education level (main particpant)	
High school	3
Vocational/trade education	2
University/college max 3 years	6
University/college over 3 years	17
Total	28

Table 5: Overview of participants' ages.

Age	
Small children (0-5 years)	8
School children (6-14 years)	12
Youths (15-17 years)	4
Women (18+ years)	24
Men (18+ years)	25
Total	73

Fieldwork and Data Collection

Each household participated for six months. The first participating household started their collection period in October 2021 and the last household ended their collection period in October 2022. Thereby, the collection periods of the 28 households together covers a full calendar year. Before the beginning of the collection period, the main participant of the household took part in a start-up interview which aimed at mapping the general habits and interests of the participant in terms of clothing and textile consumption and disposal. The participant also received information about the collection period.

After the start-up interview, the participating households were asked to collect all clothing and other products made of textile which they would have otherwise thrown out, donated to charity, given away or otherwise disposed of during a period of six months. If the participants needed to dispose of something urgently, either because it was inconvenient to store, they were selling it, someone else needed or for some other

reason, they were asked to register the piece according to acquisition method, fiber content, age and disposal method in addition to taking at least one photo of the piece.

After the first half of the collection period (about three months), the participants were visited by the PhD candidate. During the visit, an interview was carried out about each of the collected textile pieces. For each piece, the participants would be asked about acquisition method, age of the textile, use frequency of the textile, last use of the textile, storage method, reason for disposal, planned disposal method and other questions relevant for the specific textile. The participants did not remember all information about all pieces of textiles and sometimes the conversation naturally excluded certain questions, but as much information as possible was collected about each piece during the interview. This was repeated during the second visit after the end of the collection period. During this interview, the participants were also asked about their experience of participating in the study, gathering textiles, and talking about their textile waste.

After the interviews, all textiles were brought back to SIFO for registration. The registration took place in two parts: a registration of physical properties and a registration of information from the participant interviews. For the registration of physical properties, all information that was possible to gather about each piece only by looking at it was recorded. This applies to information regarding type of textile, weight, brand, color, print, fiber content, number of fibers, construction, wash temperature, ecolabelling, general condition, holes, broken seam, color change, shrinkage/shape change, pilling, felting, and repair/alterations. In addition, each textile was registered according to the categories used in work package 2 of the Wasted Textiles project for easy comparison. For the registration based on interviews, information was recorded regarding the user of the textile, age of user, gender of user, disposal reason, whether it was a favorite, total age of textile, current age of textile, use frequency, last time it was used, acquisition method, planned method for disposal and repair/alterations. Afterwards, the two registration files were merged before analysis.

1.3 Challenges

During the three stages so far accomplished in the project, several challenges were encountered. Initially, it was difficult to recruit participants of different types, as mostly women in their thirties with high levels of education and a specific interest in sustainability and/or clothing signed up. In order to work around this issue, it was decided to aim the recruitment process towards men specifically. In addition, a thorough selection process was carried out before potential participants were contacted.

During the interviews, it was discovered that textile waste seemed to be a very sensitive topic for many of the participants who often seemed restrained when asked about their discarded textile. The conversation was often guided by the participants towards the textiles they had not discarded, had repaired, had owned for a long time or other textiles they felt more pride or satisfaction towards. The participants often seemed to feel like they needed to provide justifications for why they were discarding pieces with no obvious damages. Sometimes even for pieces that looked worn and old

or had damages, they provided justifications for why they didn't feel like they could keep using them or had not attempted to repair them. This may testify to a general perception of waste creation as something to be avoided and perhaps even to be ashamed of.

A third challenge relates to registrations and preparing the raw data for analysis. The data collection is based primarily on qualitative methods like interviewing and observations. For registrations of anything that is not directly observable, the qualitative interview data is turned into quantitative data which brings along certain limitations. Firstly, participants may not remember all information related to each textile piece, such as the age of a pair of socks og how much a duvet cover has been used. Secondly, in an interview situation it is important to keep the conversation flowing and to make the participants feel comfortable. This may result in that some questions are skipped and thereby some information is not recorded.

Finally, the possibility that informant may have over- or underreported their amounts of discarded textiles is a possibility. For some informant, as mentioned above, textile waste is considered a very sensitive topic which may have led some to discard less during this collection period. This could especially be items such as underwear which some were hesitant to talk about. However, for some participants, the collection may have represented a good opportunity to clean out their closets and get rid of some things which may have led to more disposal than would have usually occurred during a period of six months. This needs to be taken into account when analyzing the data material.

2. Textiles in Numbers and Figures

In this chapter, some preliminary findings related to types of textiles, condition of the textiles, fiber content and age of the textiles will be presented. The numbers presented here are based on the registrations that have been carried out so far. In total, over 3000 pieces of textiles have been collected. Until now, registrations have included 2307 pieces of textiles with a total of 389.5 kg. Of the registered textiles, 72% are clothing and shoes, including accessories and outdoor clothing, and 28% are other textiles (see Figure 2). The other textiles are textiles that fall outside of the clothing category such as linen, towels, toys, bags, etc. It is important to note that since textiles from four households have not yet been registered, the final results may vary from the results presented here.

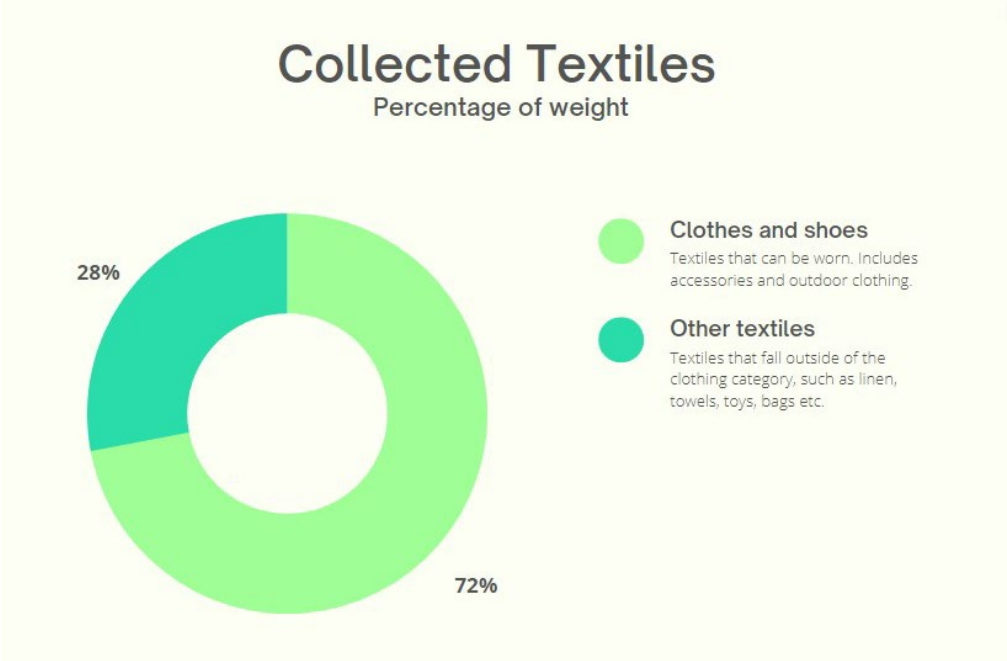


Figure 2: Graph of the distribution of collected textiles between clothes and shoes and other textiles, N=389.5 kg.

2.1 Collected Textiles

In this section, numbers on the distribution of textiles between the three included areas in Norway and the types of textiles collected will be presented.

Textiles by area

Textiles were collected in three areas in Norway: Oslo, Vestfold and Salten. Since Oslo has a higher number of participants than the two other areas, the overview of discarded textiles by area is shown as weight per person. As the graph shows, 23.4% of the collected textiles that have been registered so far were from participants in Oslo, 41.8% were from participants in Vestfold and 41.8% were from participants in Salten (see Figure 3). According to this graph, participants in Vestfold discarded the most textiles during their participation period. It would, however, be wrong to conclude based on this

that people in Vestfold discard more textiles than people in Oslo and Salten. Since this is based on a relatively limited number of participants, it is important to take into account the life situation of each participant when attempting to explain variations in the numbers. For the numbers regarding discarded textiles by area, it is relevant to consider that several of the participants moved during the collection period which is an event that often stimulates disposal of many things such as textiles and clothing.

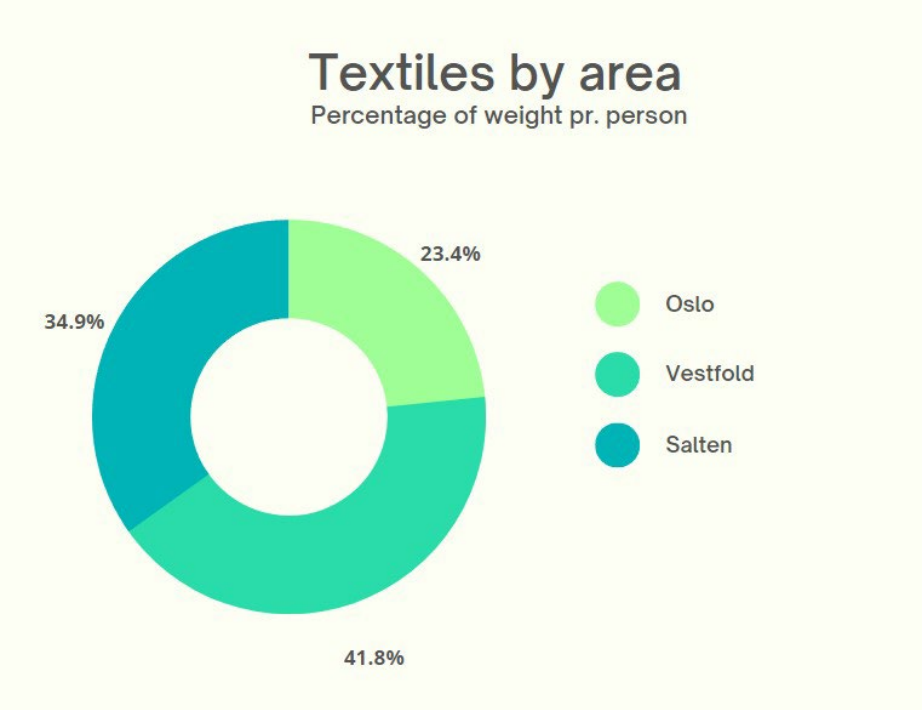


Figure 3: Graph of the distribution of discarded textiles by area, N=389.5 kg.

Textile types

The textiles were registered according to the waste picking analysis categories used in work package 2 of the Wasted Textiles project. Some categories were merged (such as outerwear, padded and non-padded which were merged to outerwear) since little was found in each category and a lower number of different categories gives a better overview. As Figure 4 shows, household textiles (such as linen, towels, dish towels, cloths, tablecloths, curtains etc.) is the largest category followed by bottoms (pants, jeans, shorts, skirt), thin tops, clothes for child and baby, outerwear, thick tops, shoes, clothing for sports/work/work out, underwear, socks, dresses, equipment, accessories, bags, and carpets. The smallest categories were sanitation (such as bandages) and garden textiles (such as fabric potholders).

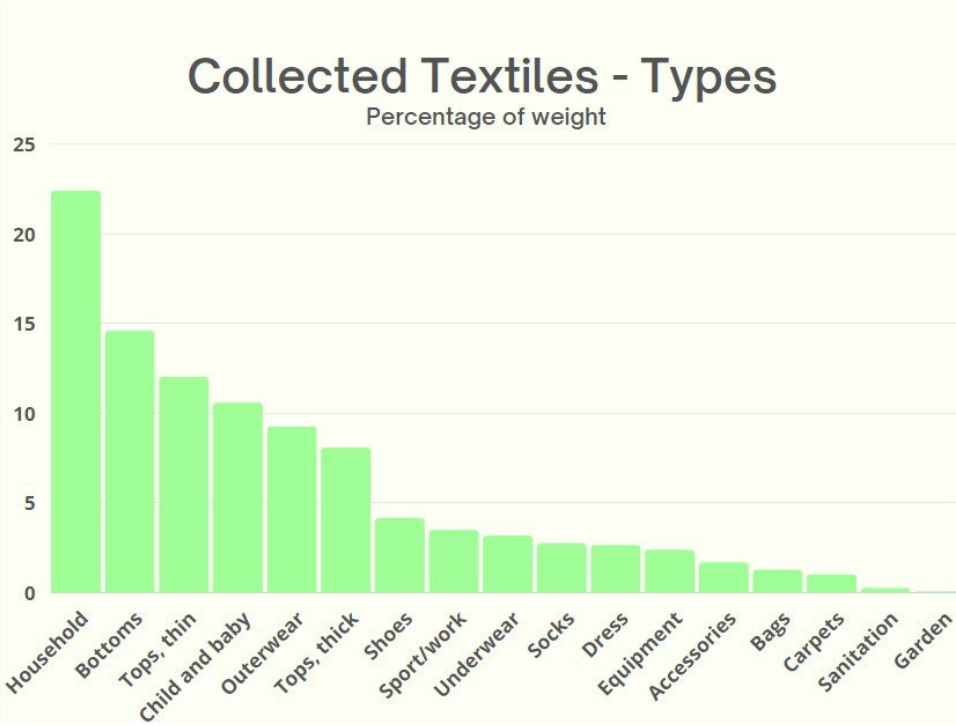


Figure 4: Overview of collected textiles based on weight and distributed in types, N=389.5 kg.

In Figure 4, the distribution of textiles into categories is based on weight. If, however, this distribution is based on number of textiles, the categories look differently. Figure 5 shows the distribution of collected clothes (other textiles have been excluded) as an example. Now the largest category is clothes for child and baby followed by socks, thin tops, underwear, bottoms, accessories, thick tops, outerwear, clothes for sport/work/work out, dresses and finally shoes.

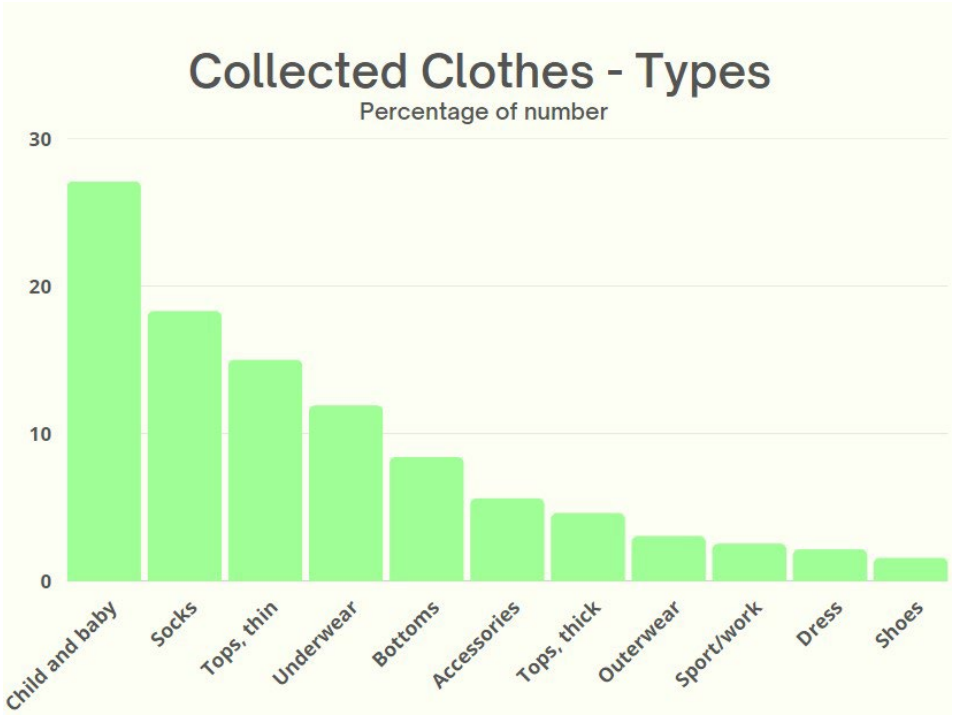


Figure 5: Overview of collected clothes based on number and distributed in types, N=1793.

2.2 Condition of Textiles

Condition scale

In order to evaluate the condition of the textiles, a scale from 1 (Not usable) to 5 (Like new) has been applied. The grade 2 is given to textiles with large changes, 3 for noticeable changes and 4 for minor changes. For grades 2-5, the piece is still considered usable but with changes and damages and varying levels. The changes are identified during registration, as described above, and looks at whether the piece is damaged in any way such as holes, broken seam, discoloring, stains, shrinkage or pilling. Each piece is then given an overall grade. Condition evaluation has been carried out by the PhD candidate and a research assistant. Parts of the evaluation was carried out together to ensure coherence in the evaluation. This method is based on a former PhD project carried out by Kirsi Laitala (2014).

Below are some examples of clothing and other textiles to illustrate the meaning behind the grades (see Figure 6). An example of a piece of clothing that received the grade 1 (Not usable) is a pair of black panties. They have been eaten up by a dog, so the bottom part is completely missing. These are not usable anymore for the purpose as underwear. An example for other textiles is the pillow in the image below the panties. It has been washed in the washing machine and is hardly even recognizable as a pillow now.

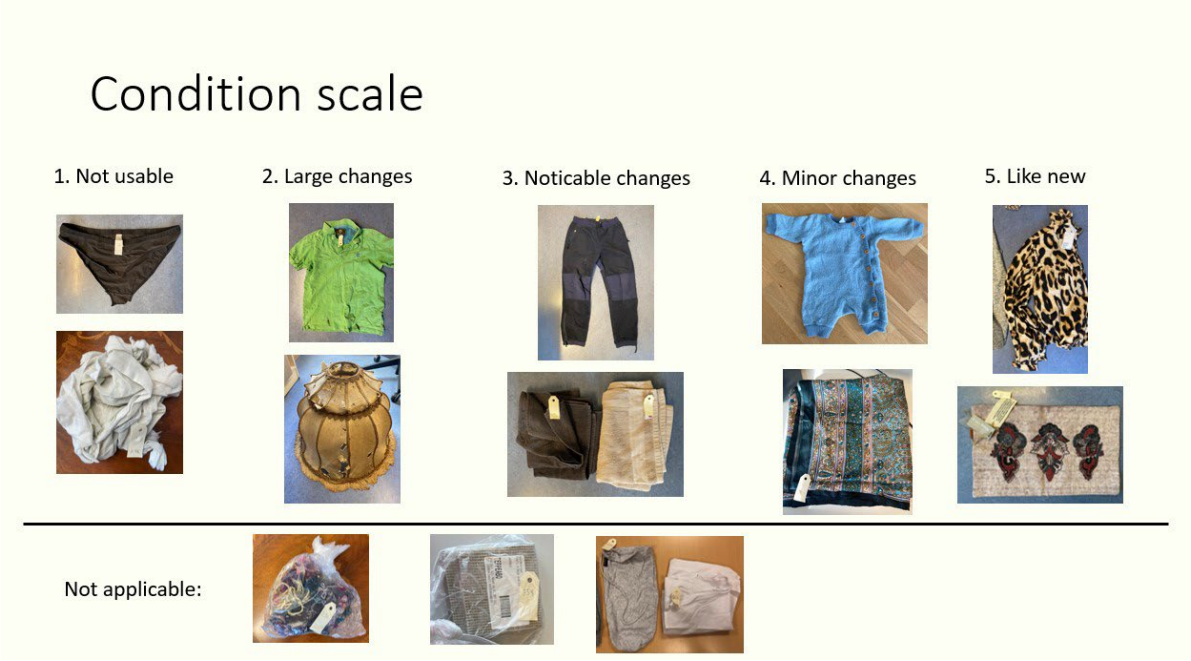


Figure 6: The condition scale applied in this project and examples of graded textiles.

Grade 2 (Large changes) is illustrated through a green polo T-shirt with small holes, thin and worn fabric, color change and, most importantly, greasy oil stains all over which makes the piece impossible to wear or handle without making everything else dirty as well. For household textiles, a lamp shade is used to illustrate grade 2. As visible in the photo, the lamp shade has many large holes but could still be used as a

lamp shade or possibly even be fixed. However, what is not visible from the photo is the extent of mold covering the lamp shade which means that the smell emanating from the piece is very bad. Therefore, the lamp shade has not been kept and stored in the project but only registered and then disposed of.

Grade 3 (Noticeable changes) has been given to, among other things, a pair of outerwear pants. They are a bit faded, have some small stains and a little bit of pilling. They are visibly used and worn but are still in good condition for further use. For other textiles, grade 3 was often given to pieces such as the towel and bathmat seen in Figure 6. These are both stiff from washing and have some discoloring or stains but may very well still be used. For grade 4 (Minor changes), the blue baby one-piece is an example as it has been visibly used, but it is still in very good condition with only minor damages showing. The same goes for the scarf which has a few pulled threads and a tiny bit of fading from the sun but is otherwise in very good condition and can definitely be used more.

Clothing and other textiles which have received the grade 5 (Like new), have no damages or changes. Many of them still have the clothing tag on them, like the examples in Figure 6. Both the shirt and the pillow cover are less than a year old and have never been used. In addition, both still look new. Some pieces would have the tag on them but because they had been stored for longer times or under suboptimal conditions, they did not look new anymore and could not receive the grade 5, even though they had never actually been used.

An additional category included in condition evaluation is for textiles where evaluation of condition does not apply. The examples for this category as shown in Image 2 is a bag of scrap yarn and string, four carpet samples and two textile bags. These pieces are not meant for further use which makes an evaluation of condition partly based on whether the piece is still usable not applicable.

Condition of the textiles

Based on the overall grade of each textile as described above, an overview of the distribution of textiles with grades 1-5 (and the category “Not applicable”) has been created (see Figure 7). Here, it shows that 16% of the textiles are evaluated as not usable, 13% to have large changes, 26% to have noticeable changes, 27% to have minor changes, 10% to be like new and for 8% the condition scale is not applicable. This overview is based on number of textiles. For weight, this overview would potentially look different, as many of the usually younger textiles like socks, pantyhose and underwear are usually also the pieces receiving the lowest grades.

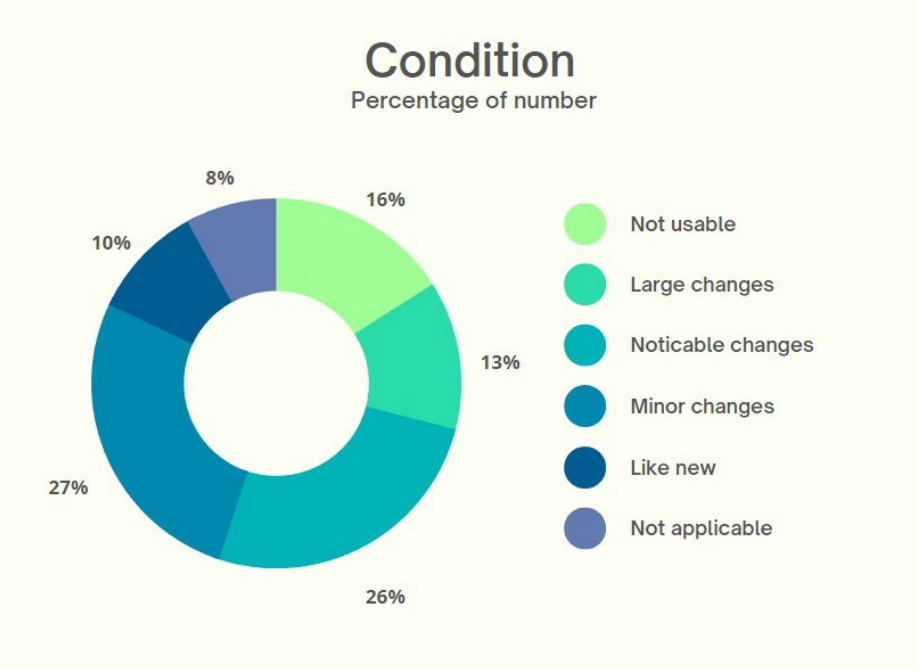


Figure 7: Overview of the overall condition of the collected textiles based on the condition scale, N=2703.

Moving forward, it will be interesting to compare the condition of the textiles to, for example, type of textile, use frequency and fiber content to discover potential correlations between these variables. In addition, it could be interesting to look at whether the evaluation of the textiles' condition based only on the physical appearance correlates with the reasons for disposal as described by the participants. Thereby, it will also be possible to look into whether a lower condition is more acceptable for some textile types than for others or whether some types of damage are seen as more acceptable than others by the users. For example, it may perhaps be more acceptable to wear a worn pair of jeans than a worn pair of suit pants. For some people, pilling is not an issue but for others it will not be acceptable.

2.3 Fiber Content

The fiber content of the textiles is primarily based on the clothing tag. For textiles missing the tag, the fiber content has either been discovered through online searches or by using the FabriTell fiber scanner developed by Matoha[1]. The fiber scanner has also been used in cases where the clothing tag seemed potentially faulty. The exact fiber content was registered but has not yet undergone complete analysis. Therefore, the overview as seen in Figure 8 shows a simplification of the distribution of the fiber content of textiles into three categories: 100% synthetic, 100% non-synthetic and a mix of the two. The category 100% synthetic covers textiles which contain only synthetic fibers such as polyester, acrylic, nylon etc. The category 100% non-synthetic covers textiles made entirely of fibers that are not synthetically based such as wool, cotton, viscose, linen etc. The mix category covers textiles that contain a mix of synthetic and non-synthetic fibers.

[1] https://matoha.com/fabrics-identification

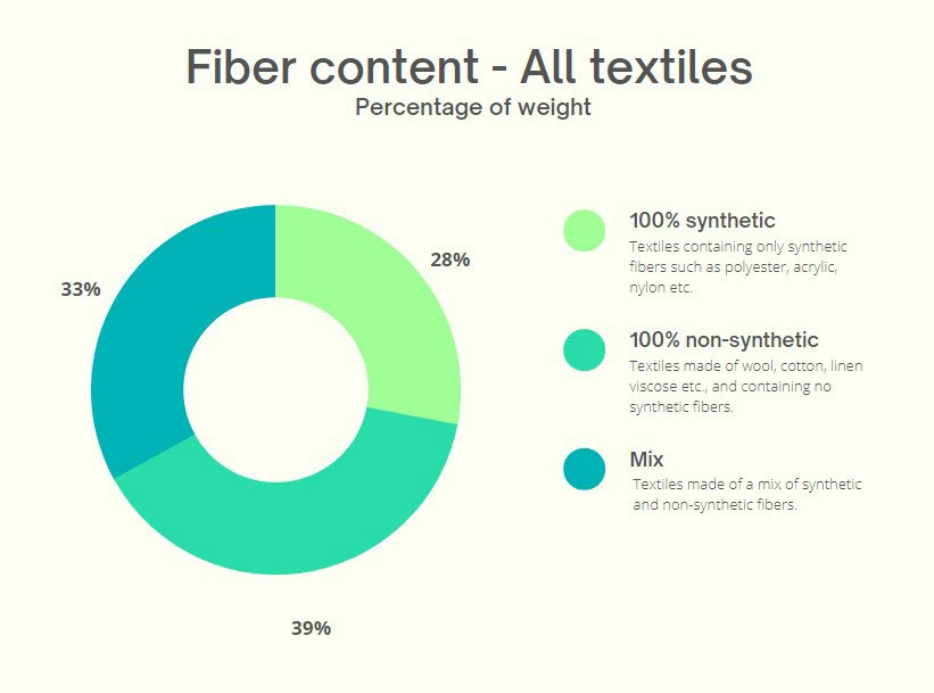


Figure 8: Overview of fiber content for all textiles divided into three categories, N=389.5 kg.

As seen in Figure 8, 28% of the collected textiles are entirely synthetic, 39% are entirely non-synthetic and 33% contain a mix of synthetic and non-synthetic fibers. These results are very similar to the preliminary results of work package 2 in the Wasted Textiles project. Here, 32% of the registered textiles were entirely synthetic, 35% contained no synthetic fibers and 33% contained a mix of synthetic and non-synthetic fibers.[2]

However, if only clothing items (including shoes and accessories) are included in the overview, the picture looks slightly different. Figure 9 shows that 38% of the collected clothing items contained only synthetic fibers, 44% contained no synthetic fibers and 18% contained a mix of fibers. If children's clothing is removed from the overview, the percentage of 100% non-synthetic goes down about 3%. This distribution is interesting compared to the amounts of synthetic fibers going into clothing production today as synthetic fibers represent 69% of all materials used for the global textile production, a number which is only predicted to increase (Changing Markets Foundation, 2021). An explanation for why the current fiber production is not reflected in the findings of this project may be found by considering the age of the textiles.

[2] https://uni.oslomet.no/klesforskning/2022/10/12/forelopige-resultater-fra-plukkanalyse-av-kasserte-tekstiler/

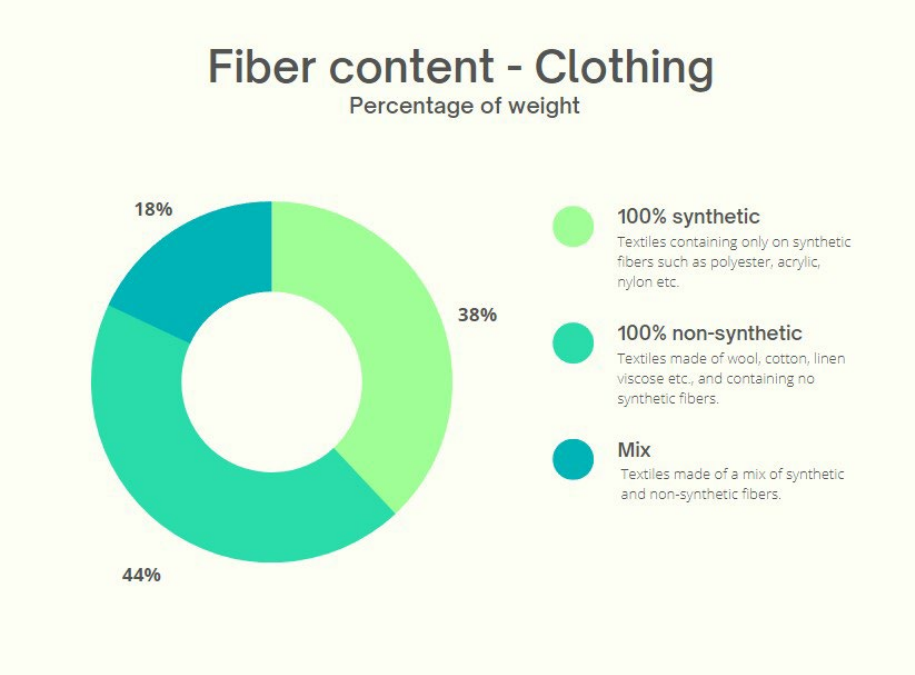


Figure 9: Overview of fiber content for clothing items divided into three categories, N=249.3 kg.

2.4 Current Textile Age

The statistics on textile age are based on the participants' self-reporting on ownership. Figure 10 shows the distribution of current textile age for the collected textiles, meaning how long the participants had themselves owned the pieces before discarding them. Some pieces may have been bought used or inherited so this overview does not reflect the actual textile age for all the garments as usually the participants did not know the exact age of something they had not acquired themselves and for items bought used it was usually not possible to say. How to measure clothing lifespans is challenging, since several measures exist such as years, number of wears, cleaning cycles and users (Klepp, Laitala, & Wiedemann, 2020), and they all depend on self-reporting by informants which may not always be reliable. It could be challenging for participants to remember the exact age, even for something that they did acquire themselves and it often proved more difficult for certain items than for others. Participants often did not remember the exact age for item such as dish towels, kitchen cloths and socks which were items often described as "things that come and go" in the household or wardrobe.

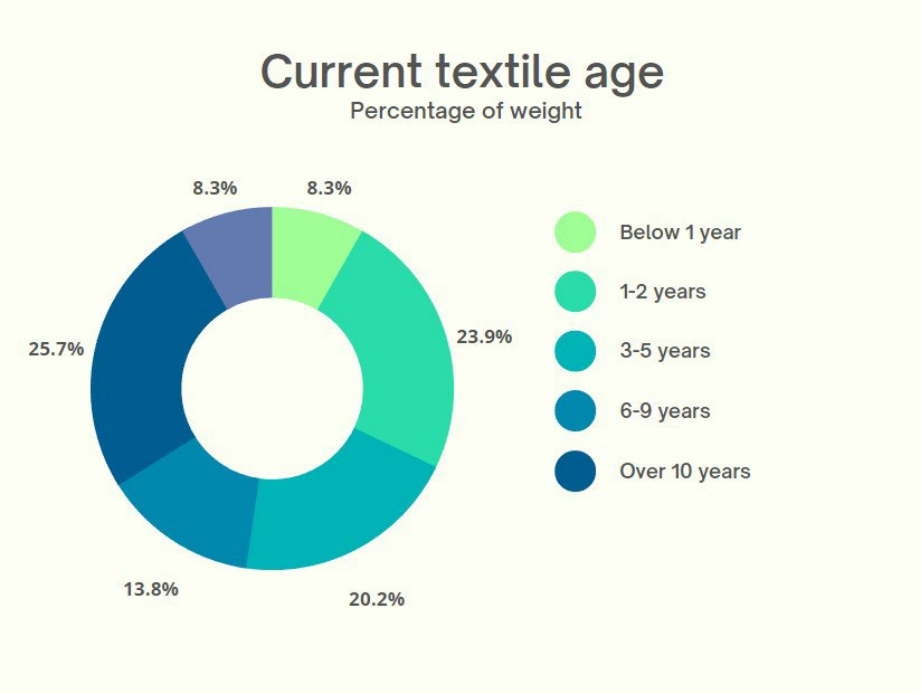


Figure 10: Overview of the current age of the collected textiles divided into four fractions, N=389.5 kg.

According to Figure 10, about 8% of the textiles were below one year old at the time they were discarded, about 24% were 1-2 years old, about 20% were 3-5 years old, about 14% were 6-9 years old, about 26% were over 10 years old and for about 8%, the current age was not remembered. This illustrates that a large share (over a quarter) of the textiles registered were more than 10 years old. As older textiles contain lower amounts of synthetic fibers, a large share of textiles that are 10+ years could explain the distribution of fibers found here. In addition, Norwegians in general use a lot of wool compared to most other countries (Sigaard & Laitala, 2023), which may also be an explanation.

The overview in Figure 10 is based on weight. Based on number of textiles it would look a little different since many pantyhose and much underwear is only between a few weeks to a few years old. In addition, a lot of children's clothes has not been owned for very long. These are all pieces with generally low weight. Thereby, by basing the overview of numbers, the two youngest fractions would be larger.

Textile age says little about how much use the participants have had out of each piece. Some pieces have been kept for a long time but hardly ever used while others have not been owned for very long but have been used constantly. Therefore, in order to make sense of these findings and to get the full understanding of the durability and lifetime of the textile, it will be important to also consider the use frequency of each piece. This will be explored further as the project progresses based on the informants' self-reporting.

In Figure 11 below are pictures of five pieces of clothing to illustrate the difference between textile age and use frequency. The youngest piece of clothing collected in the

project is the pair of nylon stockings in the picture to the left. These were owned for only one week and used just once before they were discarded as they had been bought for and used at a party the previous weekend where they had ripped. The oldest piece of clothing collected is the wedding dress in the picture to the right. The dress is 51 years and was worn twice; once by the owner for her own wedding and once by her niece at her wedding. The difference between the age of these two pieces is 50 years but the dress was only worn once more than the stockings.

Figure 11: Examples of textiles of different ages and use frequency.

The other examples show a pair of jeans which were owned for less than a year before they ripped in the crotch, a sweater which was owned for 6 months before the owner found the condition unacceptable to keep and a scarf which was never used. The jeans have been included as an example to show that the younger fractions of textiles are not just made up of new textiles of good condition (like the examples of grade 5 textiles above) or textiles that break easily such as pantyhose, but also textiles that should be durable but turned out not to be. The sweater is an interesting example because it has lasted for just 6 months during which time it was only worn about 5 times and washed once or twice. However, the condition of the sweater would indicate that it had been used for much longer. The fabric is flat and seems worn and it has a lot of pilling. This is an example of a textile that should have never been produced as the durability is not good enough. The scarf is an example of an old textile (above 10 years of age) which has been stored as long as it has been owned but never used. The condition of the scarf is very good (grade 4), but the owner did not like the style and has therefore never worn it. It was kept because it was received as a gift and the owner felt that it was impolite to discard it.

3. The People Behind the Textiles

In this chapter of the project note, focus will be on the participants who discarded the textiles. Demographic information related to age and gender of the textile users will be presented along with examples and some possible explanations when differences are encountered.

3.1 Textile User – Age

The age of the last user before the textile was discarded has been registered for each piece. Figure 12 shows that 18% of the textiles had been used by children under the age of 10 prior to disposal, 8% had been used by teenagers (11-18 years), 65% had been used by adults (>19 years) and 9% had been used by people of several ages. This last category of several users contains textiles such as towels and linen which are often shared in a family. By far the largest user group is therefore adults which is understandable as this was the largest group of participants. In addition, most other textiles than clothing were owned by adults such as bags and household textiles.

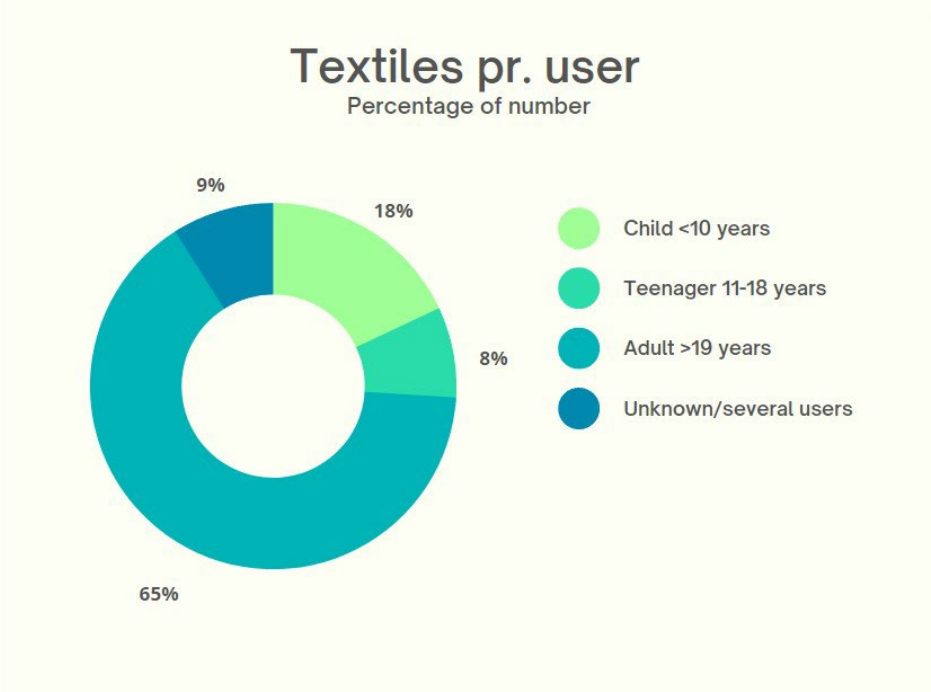


Figure 12: Overview of age of last user before the textile was discarded, N=2703.

In Figure 13, the category of adults is broken down into age fractions of 10 years. From this figure, it shows that more than a third (37%) of the textiles came from participants in their thirties while only about 8 percent came from participants in their seventies. Again, this is not surprising as a large share of the adult participants (14) were in their thirties while only four participants were in their seventies.

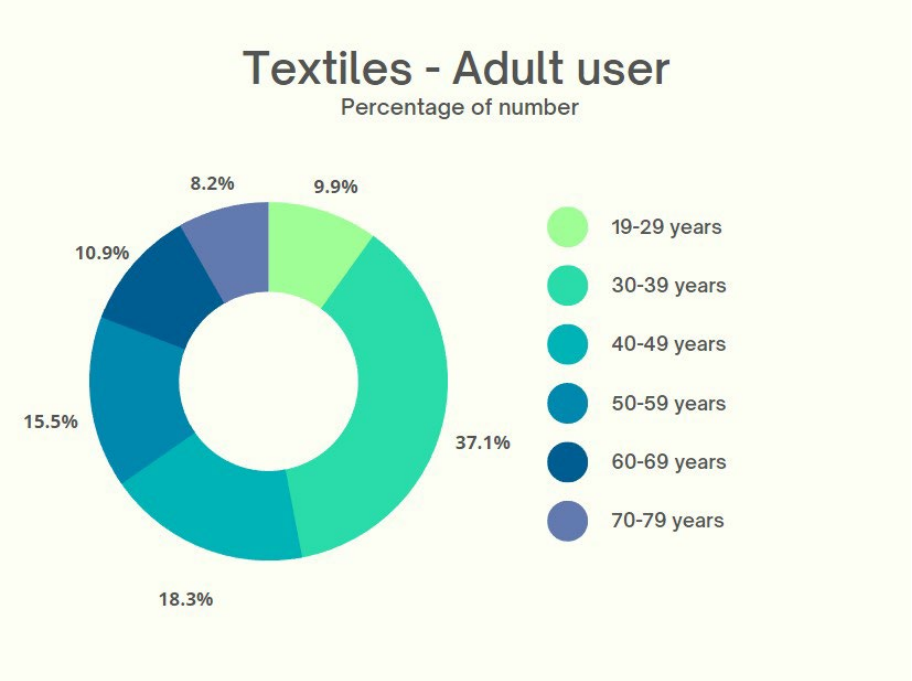


Figure 13: Overview of discarded textiles by adult users in 10-year fractions, N=1435.

To make up for the difference in number of participants in the age groups, the number of discarded textiles has been divided between participants in each group. This gives a very different picture of the amount discarded within each group. Now the age group with the most discarded textiles on average is people in their seventies and the lowest amount on average is from people in their fifties (see Figure 14). This is a very different result from much other research which suggests that the overturn of clothing is lower for older people compared to younger (see for example Domina & Koch, 2001; Laitala & Klepp, 2020; Lang, Armstrong, & Brannon, 2013). Therefore, it would be an incorrect conclusion to state based on these data that people in their seventies discard more textiles than other age groups. Instead, the answer to this difference must be discovered by looking closer at the participants. Two of the participants in their seventies moved during the collection period which is a time where people often discard many things, including textiles. In addition, this couple moved from a house to a much smaller apartment with less storage space. This may be an explanation to why so many textiles were discarded from this age group compared to the others.

Figure 14: Number of textiles discarded on average by age group, N=1435.

If only clothing is included and all other textiles are left out, the picture changes a little again (see Figure 15). The number of discarded textiles by participants between 19 and 29 years remains the same, indicating that this age group has not discarded any other types of textiles than clothing. For the age group 40-49, the average amount discarded textiles is reduced to less than a third for only clothing compared to when other textiles are included.

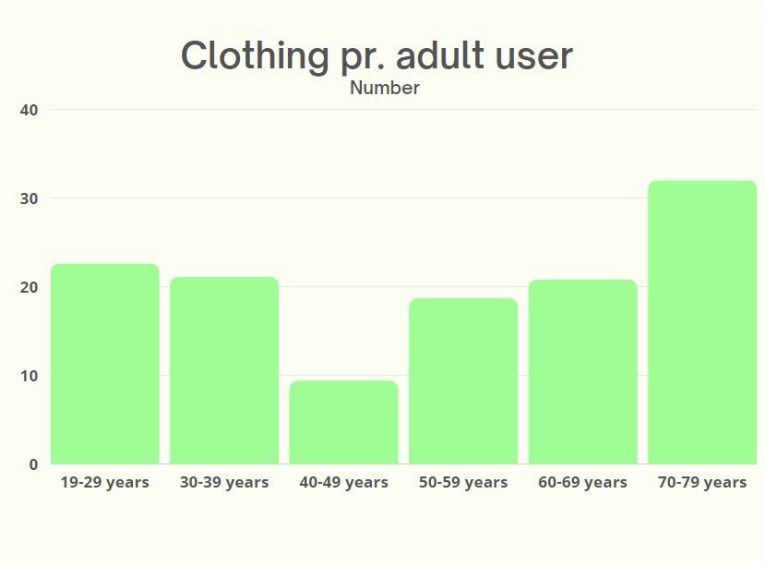


Figure 15: Number of clothing pieces discarded on average by age group, N=810.

The differences in number of textiles discarded within the age groups are, however, large. The participants who discarded the least (0 pieces and 0 kg each) were John, a man in his fifties, Nina, a woman in her forties and a boy, six years old. The most surprising of these participants is the boy, as children have a high overturn in clothing since they grow out of them and wear them out fast. However, a simple explanation exists for this case. The boy is the second child in a family with three boys, so his younger brother has inherited all of his used clothing. Thereby, it has actually gone out

of use by that particular owner but has not been registered by the parents as a garment going out of use since it is still in use within the household, just by a different user.

The participants who discarded the most were Dorthe, a woman in her forties, Sonja, a woman in her seventies, and Quentin, a man in his thirties. Dorthe discarded 139 pieces amounting to 18.4 kg, Sonja discarded 85 pieces amounting to 22.7 kg and Quentin discarded 73 pieces amounting to 26.7 kg. While Dorthe discarded the most in terms of number of pieces, Quentin discarded the most in terms of weight. This point will be returned to in the following section. It is also interesting to note that all three of these participants moved during the collection period.

3.2 Textile User – Gender

Figure 16 shows the distribution of textiles between adult users according to gender. 57% of the textiles were used by women prior to disposal while 25% were used by men. 18% had several users, meaning that they were used by both men and women prior to disposal. This is mostly household textiles such as linen, towel, cloth etc. but also bags and some clothing like socks and outdoor clothing.

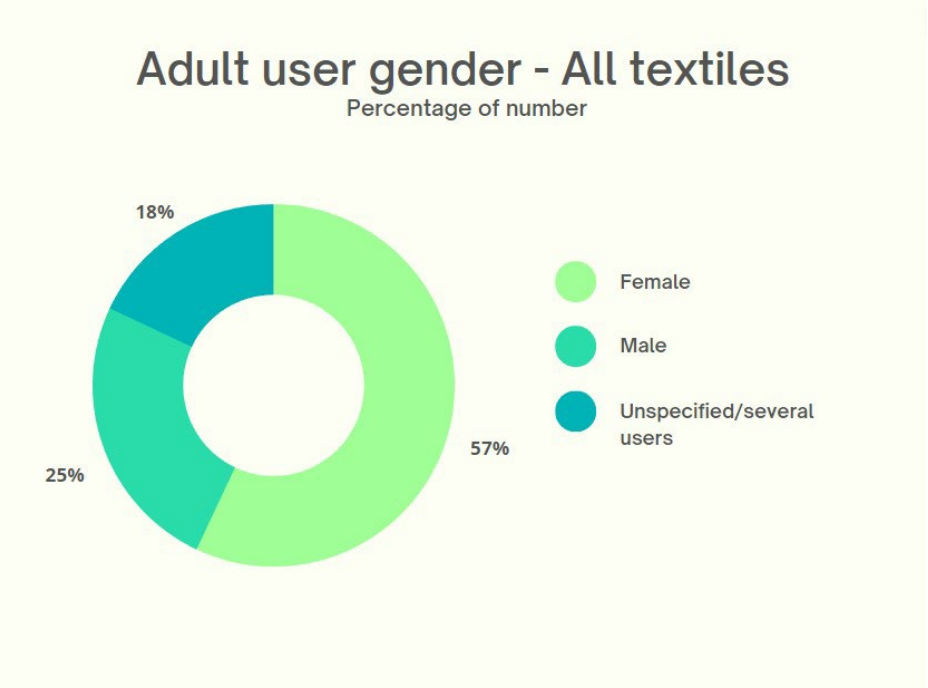


Figure 16: Distribution of textiles between adult users divided by gender and based on number, N=1435.

According to this graph, the female participants have discarded more than twice as much of the collected textiles than the male participants. Research has shown that women purchase more clothing than men (Lang et al., 2013), which could be an explanation to why the women in this project are also discarding much more than the men. However, the graph in Figure 16 is based on number of discarded textiles. Figure 17 below is based on weight of discarded textiles and here the distribution looks rather different. The women have still discarded relatively more compared to the men, but the

ratios have evened out more. The female participants are now accountable for 48% of discarded textiles while the male participants are accountable for 38%.

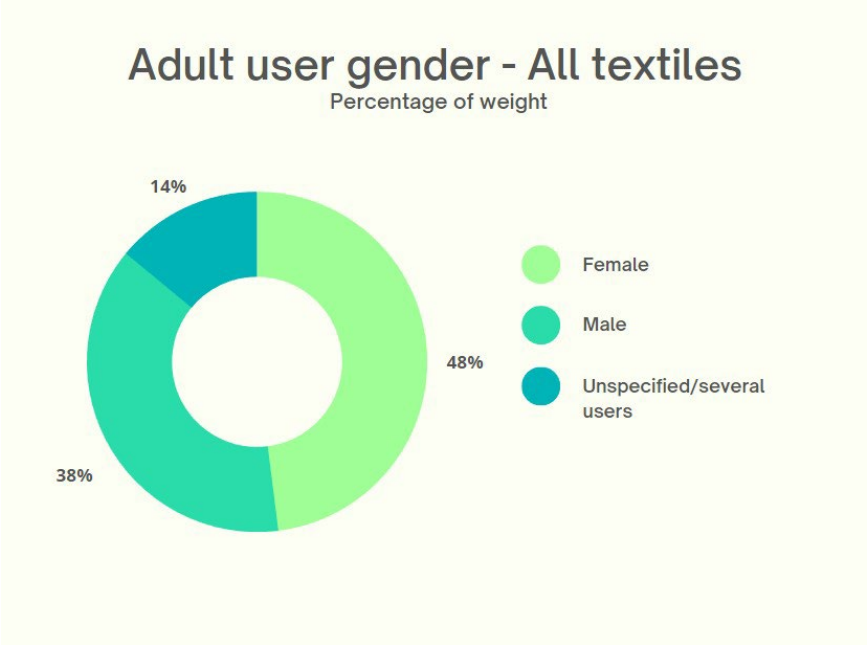


Figure 17: Distribution of textiles between adult users divided by gender and based on weight, N=274.9 kg.

This difference between the graph based on number and the graph based on weight could potentially be explained by looking at what the men and women in the project have discarded. Figure 18 shows a selection of textile categories and their distributions between female and male participants (shared textiles are left out). The only category where the men have discarded more (in number) than the women is the category for thin tops. Another category that stands out is household textiles where the women are responsible for by far the largest share.

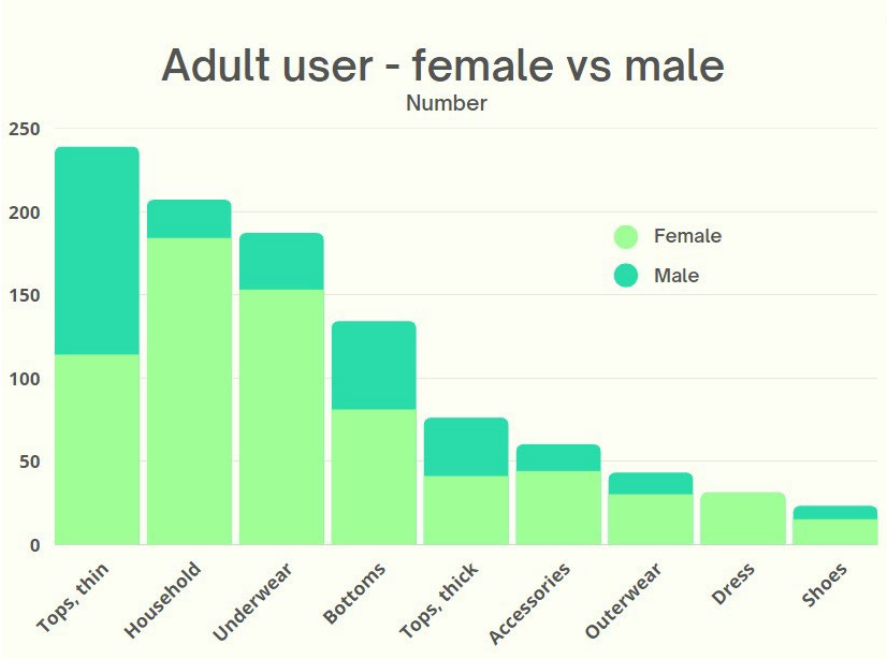


Figure 18: Illustration of the differences between genders in what types of textiles are discarded, N=1435.

Part of this difference may again be explained by looking at who moved during the collection period. However, another part of the explanation may be that more women claimed ownership of household textiles during the interviews than the men did. Even in families and for couples living together, more often the woman would explain that a piece of household textile had belonged just to her or had been used just by her than the men would. It would be interesting to explore this seeming difference further through the qualitative data.

An example: Ilse and Ivan

An example of the difference between how much the female and male participants had discarded based on number versus based on weight may be illustrated by looking at the couple Ilse and Ivan. They are a couple in their thirties living in Oslo. During the collection period, Ilse discarded 44 pieces of clothing (other textiles have been left out here for the purpose of comparison) and Ivan discarded 11 pieces. The total of Ilse's 44 pieces came to 3.7 kg which is the exact same weight that Ivan's 11 pieces came out to even though Ilse discarded four times as many pieces of clothing as Ivan. The explanation for this can be found by looking at the kinds of clothing pieces that each person in the couple discarded. Ivan's pieces were things like a large woolen sweater, several pairs of jeans and a heavy jacket while Ilse's pieces mostly consisted of pantyhose and stockings which are very light weighted pieces of apparel. Even for the types of clothing that they discarded within the same category, such as thin tops, the weight of Ivan's pieces were higher than for Ilse's pieces. Examples of the clothing pieces are shown in Figure 19. This example shows how important it is to be aware of whether data on textile disposal is based on number of clothing pieces or on weight.

Figure 19: Example of the difference between number of textiles and weight.

4. The Way forward: How to understand the data?

The main focus for this project note until now has been the quantitative data with some support from the qualitative data through examples. As explained above, this project is based primarily on qualitative methods with interviews where data has been subtracted and turned into quantitative data. Qualitative and quantitative data may very well be combined to obtain a deeper and fuller understanding of textile consumption. The contribution of qualitative data to research is exactly to provide depth by explaining a lot about a little. This may be used to understand people's reasonings and considerations towards topics such as textile disposal. It can aid in understanding the complexities of the topic by getting close to people's own experiences and narratives.

Moving forward, the aim of this PhD project will be to attempt to understand the people behind the numbers presented above. The project will attempt to create understandings of what impacts consumption and disposal of textiles as well as the challenges consumers encounter in their everyday lives which impact this consumption. Consumption of textiles is seen as part of other practices that people carry out in their lives and looking at these may therefore provide important insights into how and why clothing and other textiles are used and disposed of. In the following section, examples from participant interviews will be used to illustrate this point.

4.1 An Example: Life Course Events

Looking at how life course events may affect clothing and textile consumption will be one of the approaches applied in the project to understand textile disposal. Life course events are events that usually occur or may occur for people during their lives which are perceived as important milestones either by the people themselves or by society. In the following, four life course events identified through the interview data have been selected and examples for each will be applied to illustrate how these may affect textile consumption and disposal. The first is moving to a new place, which has already been mentioned at several points in this document to explain the numbers presented. Four of the participating households (six adults) moved during the collection period. According to Statistics Norway, 13 out of 100 people moved in Norway during 2021.[3] That makes roughly six people during six months which means that the participants of this study are somewhat representative of the Norwegian population in terms of moving.

The second example of a life course event presented here is getting a new job which is also something that will happen to most people during a lifetime, but it may not be significant in terms of textile consumption for everyone. The third example is death in the family which may impact the acquisition of clothing if new clothing is acquired for attending the funeral or other traditional events related to the passing of a family member. As disposal of textiles is the focus of this project, the example here will be focused on inherited and unneeded or -wanted textiles. The last example is leaving home for the first time, which could also be called coming of age and thereby include

[3] https://www.ssb.no/befolkning/flytting/statistikk/flyttinger/artikler/de-fleste-flytter-kort

other experiences that may alter a person's wants and needs in terms of clothing and other textiles.

Moving to a new place

Dorthe moved between apartments in the beginning of the collection period which prompted her to discard a lot of textiles and clothes. As mentioned above, she was one of the participants who discarded the most during the collection period. She had hired a moving company to come and move her things for her and as she was packing, she evaluated each item and thought:

> *"Should I really pay someone to move this?"*

For her, each item represented an additional cost since the moving company charged by the hour and more things to move meant more working hours. Therefore, many items, including textiles, ended up not making the cut for moving to the new apartment. Figure 20 includes some examples of what Dorthe discarded.

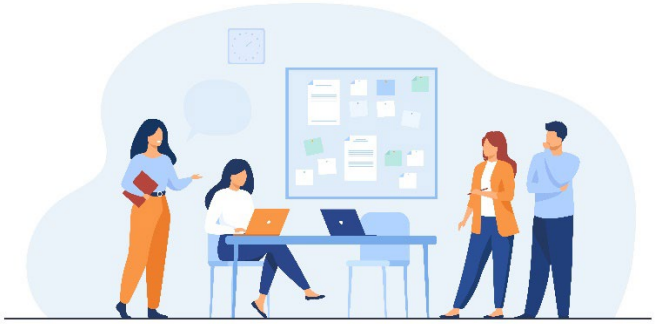
Figure 20: Examples of textiles discarded by Dorthe during her move to a new apartment.

Many of the discarded household textiles where dishtowels which she described as having been the ones she had left on the bottom of the drawer to be used when everything else was dirty. But she had realized that she owned so many dishtowels that she would never make it down in the pile to use these. She would also discard all curtains from her old apartment as they did not fit the length of the windows in her new apartment. In addition, Dorthe would talk about wanting to purchase new items for her new apartment. The dishtowels and tablecloths she discarded were old, worn and did not look as fresh anymore as she would have wanted them to. Therefore, moving to a new place represented a good opportunity for her to get rid of some of her older things and find new things for her new life.

For the clothing items she discarded, the explanation was different. The examples in Figure 20 are a Norwegian “russedress” and two pieces of clothing for cold water diving. These had all been stored in the basement storage space for many years and she never intended to use them again. Russedress is a uniform worn during celebrations of high school graduation in Norway. Traditionally, the russedress is worn every day for one month and never washed. Dorthe’s russedress is from 1996 when she graduated from high school and was only worn at that occasion. She would explain that she had no reason to keep it since she would never use it again and neither would anyone else. She had been moving it from apartment to apartment since 1996 but now it was time for it to go. For the diving gear, she explained that she had used is when she practiced diving 10 years ago but not since and now the gear was too outdated to sell or give away so she would just need to dispose of it.

Quentin represents an example of another participant who moved during the collection period. His strategy was different from Dorthe’s in that he decided to bring everything with him to the new place and then find out what he needed and what could be discarded. The result, however, was very similar as Quentin also ended up discarding a lot of textiles. As mentioned earlier, he was also one of the three participants who discarded the most.

Getting a new job



Morten changed jobs twice in the last 1.5 years. He has one of those types of jobs where the employee is provided with protective clothing, often with the name or logo of the company on it. About the clothing from his previous jobs, Morten said:

"I can't use it because I don't work there anymore, and I can't donate it because it has the logo on it, so I didn't know what to do with it."

Morten here describes his frustration about what to do with the clothing that he is left with after ending his time in the positions. He will not be able to use it at his new workplace and he does not believe that anyone else will want to use it either because of the logos. In Figure 21 are some examples of the pieces of clothing that Morten was talking about.

Figure 21: Examples of clothing pieces which Morten received from places where he had worked.

The reflective vest in the picture on the left is new with the tag still on. The fleece sweater on the right is in very good condition and looks hardly used. An interesting thing about these pieces is that in addition to not being able to use them for his new job, Morten also did not want to use them for private purposes. This was not, however, because of the logos but because of the perceived quality of these work clothes. He explained that he had better clothes to use for private purposes, so he did not need these pieces in his wardrobe.

Morten is not the only example of a participant with work clothes with company logos going out of use. Four other participants had uniforms and other types of work clothes which they did not know what to do with. They did not find a purpose for them in their private lives but, like Morten, they felt like they could not be donated, and some also felt like it was wrong to discard clothes in good condition. This left these clothes in a limbo. Many of them had been stored for longer periods, some for several years, while the owners knew very well that they would never use them again.

Death in the family

Sonja was also one of the participants mentioned above who had discarded the most textiles during the project period. Her mother had passed away a few years prior to Sonja's participation in the project and she had therefore inherited a lot of textiles and clothing. Sonja said:

> *"I took over a lot of textiles and clothing from my mother, but I don't have anything to use it for."*

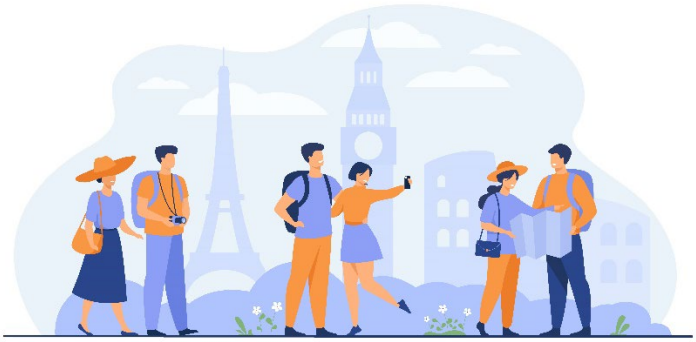
Sonja had taken over several jackets from her mother which she had tried to use but they did not really fit with her style. She said for example about the white jacket in Figure 22 that she did not want to wear a white jacket for hiking in the forest, so she did not have an occasion to wear this. As is also portrayed in Figure 22, Sonja inherited a lot of fabric pieces meant for sowing and household textiles such as home-made tablecloths and embroidered wall hangings.

Figure 22: Examples of discarded textiles that were inherited by Sonja from her passing mother.

Sonja had taken over the textiles because she did not want them to go to waste. However, she also did not have any use for them as she is not sowing as much anymore as she used to, and she cannot think of anyone else in the family who would want them. Therefore, as her and her husband were moving from a house to a relatively smaller apartment with less storage space, she needed to get rid of all the textiles that she knew she would never be using again. This included many of her mother's old pieces of fabric, clothing, and other textiles.

In Sonja's case, two life course events impacted this heavy disposal of textiles: the death of a family member and moving to a new (and smaller) place of residence. For another participant, Thomas, the death of a family member alone impacted his consumption of clothing. His brother had died several years before, and Thomas had inherited some shirts from him, but he had never used them because of the feelings he attached to these pieces related to the passing of his brother. One of the shirts still had the tag on and had never been used by anyone.

Leaving home for the first time



When Charlotte joined the project, she was 19 years old and the year before, when she was 18, she had spent several months in military service, which was the first time she left her family home for a longer period of time. When she returned, she moved out from her family home to a new city with her boyfriend, Christian, who also participated in the study. The two of them were the youngest participants in the research project. During the end of her time in military service, she and some of the others had a longing for wearing other clothes than their uniforms so while they were still out on the sea, they ordered clothes online which would arrive before they themselves arrived home. Charlotte said about this clothing:

> *"After wearing only uniform for several months, I wanted to buy some new clothes, so I ordered a bunch of stuff online, but when I came home, my style had changed so I wore it only 2 or 3 times."*

In addition to not liking the clothes she had ordered while in military service, Charlotte also found that much of the clothes she had used before leaving did not fit her style anymore. This was clothes that she had used a lot during high school just one year earlier which she now did not want to wear. It seemed like Charlotte, by leaving her family home for several months, had undergone a change of personality which could be described as a growing up or coming of age process. Figure 23 shows some

examples of clothing that Charlotte felt like she had outgrown mentally (however not physically), some of it even before wearing.

Figure 23: Examples of discarded clothing that Charlotte felt like she had outgrown.

For other participants, different changes in life had made them outgrow different types of clothing. Ylva, for example, discarded a sweater during the collection period which she said she had used constantly while writing her master's thesis. Now the sweater reminded her of that time and the person she was at that time, and she was not able to wear it anymore. Peter discarded a tank top which he had bought for and worn at several festivals years ago. Now he is a father of three small children and feels like the type of festival days which that tank top calls for are over.

Concluding remarks

Through this project note, preliminary findings of the Want Not, Waste Not PhD project have been presented. These findings indicate that most of the discarded textiles are clothes and shoes. However, when broken down into textile categories, household textiles represent the largest group of discarded textiles. In addition, findings show that about one third of the collected textiles were in a very good condition, either like new or with only minor changes. The fiber content of the textiles corresponded with the preliminary findings from work package 2 in Wasted Textiles, as there was an equal distribution between 100% synthetic textiles, 100% non-synthetic textiles and textiles containing a mix of these. It was also found that the largest group of users were adult women, especially when looking at number of textiles discarded. If weight was applied instead, the difference between the genders evened out more.

As these findings are preliminary, it is too early to provide any hard conclusions. Instead, the project note is meant to grant insights into the kind of data that will eventually be available and shared with the project group. Moving forward, the remainder of the collected textiles will be registered along with the connected interviews from the home visits. The qualitative and quantitative will then be combined and applied to creating new knowledge about clothing and textile consumption and disposal.

Among other things, the data from this project can be used to understand the complexities of clothing lifetimes by comparing the age of textiles to use frequency. It may be explored why some clothes are used a lot and some clothes is never used by comparing the statements and narratives from different users. It can help to identify consumer preferences and perceptions regarding clothing and textile consumption. Thereby, it may be possible to identify potential moments for interventions and change that could help to work towards a more sustainable consumption of textiles. In this way, the project also represents a new contribution to the research field since most research has been focused on clothing and less on other types of textiles.

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- Clothing and textiles, looking at consumption history and culture, procurement processes and consumption practices related to these product groups.
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