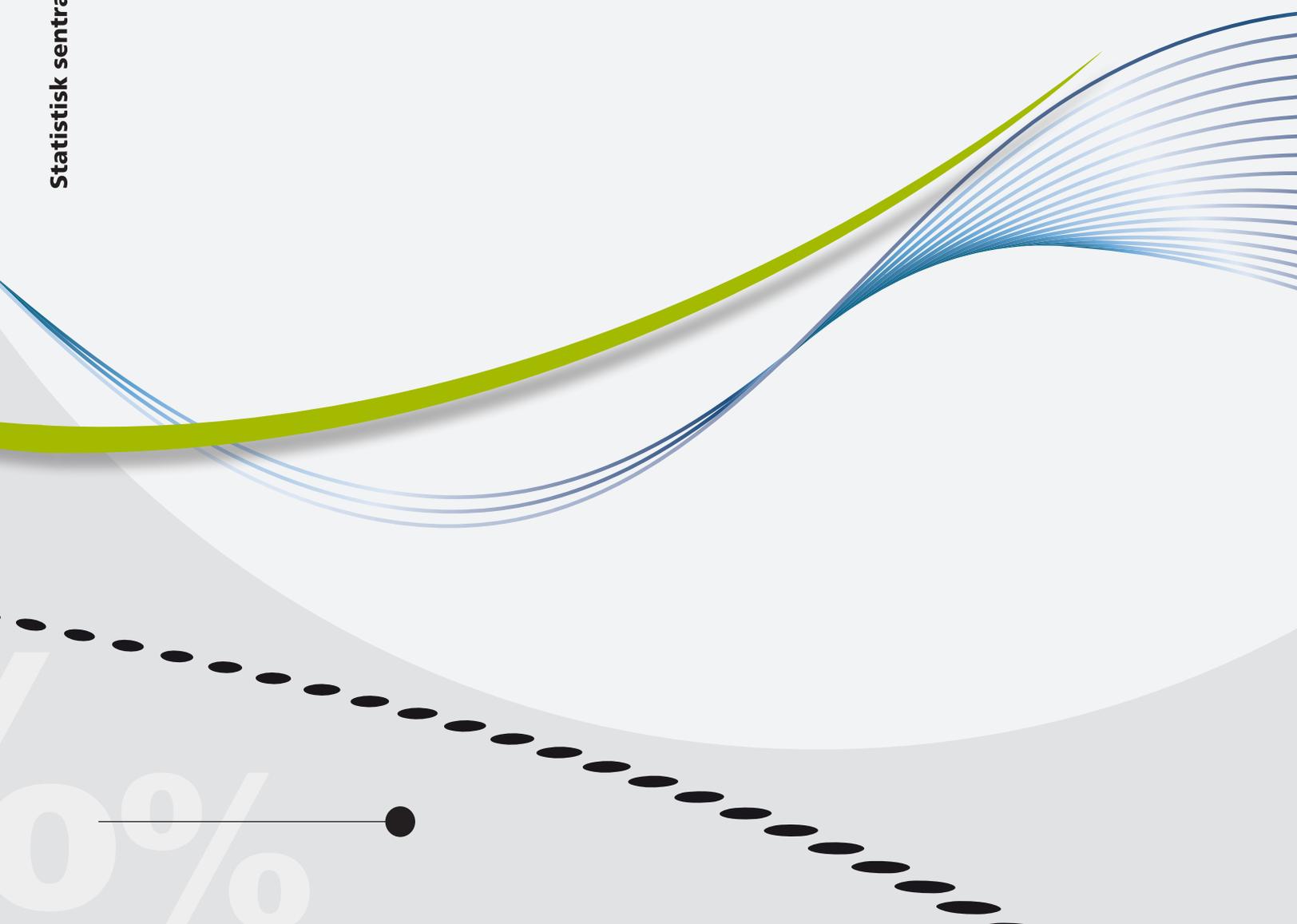




Jeanette Øynes

Volume measurement for non-market health and care services in the Norwegian national accounts



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In the series Documents, documentation, method descriptions, model descriptions and standards are published.

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Published 29. juni 2018.

ISBN 978-82-537-9775-5 (electronic)

Symbols in tables	Symbol
Category not applicable	.
Data not available	..
Data not yet available	...
Not for publication	:
Nil	-
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Preface

This report documents a project aiming at improving the volume measurement for non-market health and care services in the Norwegian national accounts. The project is financed jointly by Eurostat and Statistics Norway. The results will be implemented in the annual national accounts for 2016.

Statistisk sentralbyrå, 24. juni 2018

Lise D. Mc Mahon

Abstract

This report documents a project aiming at improving the volume measurement for non-market nursing and social care in institutions and home-based health and social care services.

The total number of beds in institutions is currently used as a volume indicator for the institution services. One of the problems with this methodology is that the volume indicator does not distinguish between private non-market and public institutions. Another weakness with the methodology is that there is no split between different institution types such as nursing homes and old people's homes. It is reasonable to assume that a bed in a nursing home is more expensive than a bed in an old people's home.

The project showed that the volume estimates can be improved by separating the private non-market institutions and the public institutions. Using the number of bed-days instead of number of beds will also improve the estimates. The estimates can be improved further by carrying out the calculation at the most detailed level (by splitting nursing homes and old people's homes, and by type of service, e.g. long-term stay, short-term stay, rehabilitation). The detailed breakdown of the output is a way to indirectly take quality changes into account.

For the home-based care services, the total number of recipients is currently used as a volume indicator. This methodology does not take into account that there are large variations in the recipients' need for assistance. There is also variation in what kind of service the user receives.

The project showed that the volume estimate can be improved by using the number of hours assigned to each user. The growth rate increases significantly when using the number of hours.

A breakdown by type of service could further improve the estimates. However, Statistics Norway concluded from the data that distinguishing between professional nurses and lower skilled workers is currently not bringing additional quality to the calculations. Furthermore, a split between non-market private providers and public providers is currently not possible with the data sets available. Further investigations are considered necessary to achieve a split between local government and NPISH data in the estimates.

The change in methodology will be implemented in the annual national accounts of Norway for 2016. The time series from 2009-2015 will be revised in the in the next benchmark revision (in 2019).

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1. Introduction

This report documents a project aiming at improving the volume measurement for non-market health and care services in the Norwegian national accounts. The project is financed jointly by Eurostat and Statistics Norway.

In Norway, the municipalities are responsible for providing health and social care services to the elderly and disabled. This means that the municipalities either provide the services directly to the users or they finance private institutions for providing the services, mainly non-profit institutions. A substantial proportion of the municipalities' resources are used on these services. This project will consider non-market nursing and social care in institutions and home-based health and social care services. The output for these services alone amounted to approximately NOK 98,000 million in 2015 and value added related to the providers contributed 2.7 per cent of GDP.

The volume growth of government produced services is measured using volume indicators. For a smaller part of non-government services, the volume growth is measured by deflating output at current prices by use of cost prices. The choice of volume indicator and methodology will directly impact the estimated volume growth. This project will evaluate the volume indicators currently used, and explore how more detailed indicators will affect the volume growth.

According to ESA 2010, changes in quality should be reflected in the volume. Several quality indicators for nursing and care services in Norway are available. Among them are weekly physician hours, weekly physiotherapist hours, percentage of beds in single rooms etc.

One way to take changes in quality into account is to have a detailed breakdown of the outputs. According to the handbook of price and volume measures in national accounts (2016 edition) "With a detailed breakdown of the outputs, structural changes within the aggregate output – which is part of the quality change – will be included in the volume estimate". This project aims at developing as detailed breakdown of the output as possible.

This report will start by describing the available sources of data, followed by a description of the current methodology. Alternative data sources and methodologies will be explored. Finally, a new method for estimating volume in the national accounts will be recommended. The aim is to implement the new method in the annual national accounts for 2016.

2. Data sources

2.1. KOSTRA

KOSTRA (municipality-state-reporting) is a reporting system used by all municipalities in Norway. It provides information on activities, services and economy in the municipalities. The financial data from KOSTRA can be broken down by function (type of service) and type of expenditure. These data are used to estimate the output for the local government in the Norwegian national accounts.

2.2. IPLOS

IPLOS is a register containing information about all recipients of care services in Norwegian municipalities, both recipients of home-based services and care in

institutions. Care services provided by both private and public providers are registered.

IPLOS contains data at the individual level. Information about service types, need for assistance, number of assigned hours etc. can be found in this register.

2.3. The A-ordning

The “A-ordning” is a collaborative between The Norwegian Labour Welfare Administration (NAV), Statistics Norway and the Norwegian Tax Administration. It contains information about salaries and employment (identified by individuals) and must be submitted by all companies and organisations that pay salaries, pensions and remunerations at least once every month.

“The A-ordning” was introduced on 1 January 2015. Data that earlier were submitted to several national agencies, are now submitted only to the A-ordning.

2.4. Central Register of Establishments and Enterprises

The central register of establishments and enterprises is Statistics Norway's register of all enterprises and businesses in the public and private sector in Norway. The register is updated on a daily basis from various administrative sources, most importantly from the Central Coordinating Register of Legal Entities.

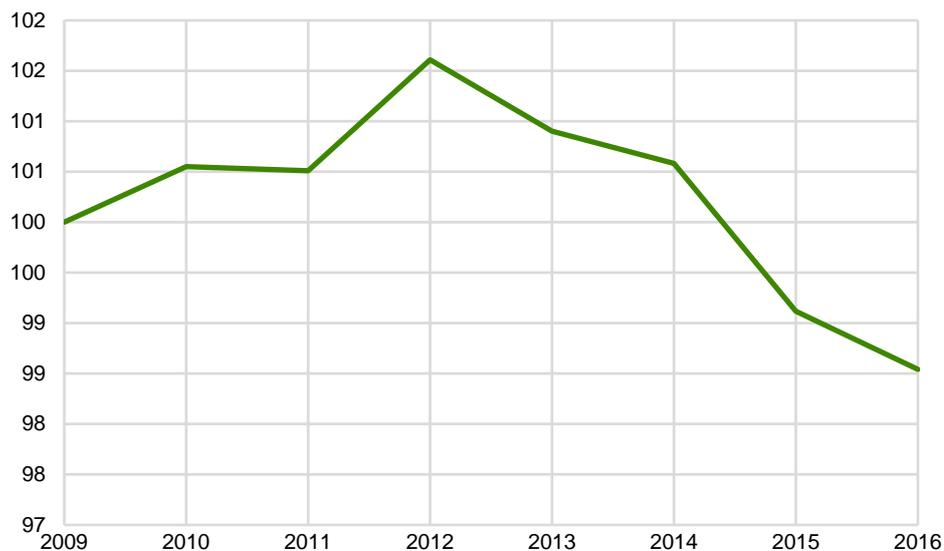
3. Current methodology

Output in current prices is calculated using financial data from KOSTRA. The service type in the national accounts is determined by the function in KOSTRA. Volume indicators from IPLOS are used to measure the change in volume, but it can be challenging to find suitable volume indicators. This chapter will describe the volume indicators currently used to measure the volume for nursing and care in institutions and home-based services, respectively.

3.1. Nursing and care in institutions

The non-market nursing and care services in institutions are recorded under KOSTRA function 253 (Nursing and care services in institutions) and 261 (institution facilities). Both nursing homes and old people's homes are recorded here. These services are produced both in the government sector and the Non-profit institutions serving households (NPISH) sector.

For the local government, the total number of beds in institutions for the aged and disabled are used as a volume indicator. The volume has decreased by an average of 0.2 per cent per year from 2009 to 2016. The decrease is related to the aim of providing services to old and disabled living in their own home rather than in institutions. Figure 3.1 below illustrates the change in volume from 2009 to 2016. Annual growth rates are shown in appendix 1.

Figure 3.1. Volume, nursing and care in institutions. 2009=100

The main problem with the data is that there is no distinction between private non-market and public institutions. The private non-market institutions should not be included when calculating the volume for the local government sector.

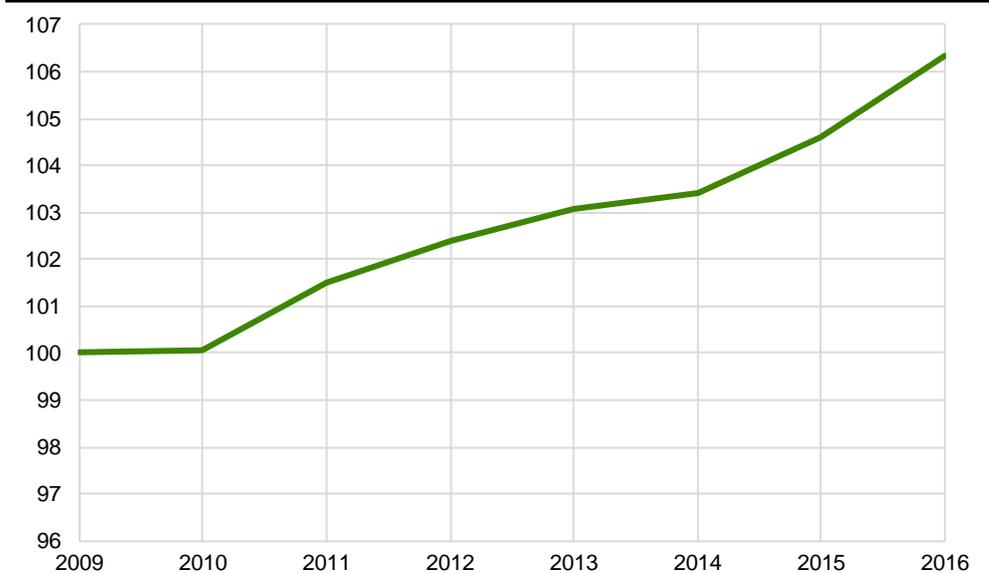
The last few years have seen privately owned institutions (mainly non-profit institutions) providing an increasing share of the beds in institutions. Including these institutions in the volume data might lead to an overestimation of the volume growth for the public institutions.

For the institutions in the NPISH sector, input price indices are used to deflate output at current prices to estimate volume development, even though it is possible to use volume indicators for this sector as well.

3.2. Home-based health and care services

Home-based care services in the national accounts include expenditures recorded under KOSTRA-function 254 (Home-based care services). These services are provided by the local government and the NPISH sector.

The total number of recipients of home-based care services is used as a volume indicator for the government sector.

Figure 3.2. Volume, home-based services. 2009=100

This method does not consider that there are large variations in the recipients' need for assistance. There is also variation in what service type the user receives. This should be reflected in the volume.

Home-based services can also be provided by the NPISH sector, and they are in the source included in the volume data for the local government. Unfortunately, it has not been possible to split the NPISH and local government sector in the volume data. Input price indices are used in the NPISH sector to deflate output at current prices instead of volume indicators.

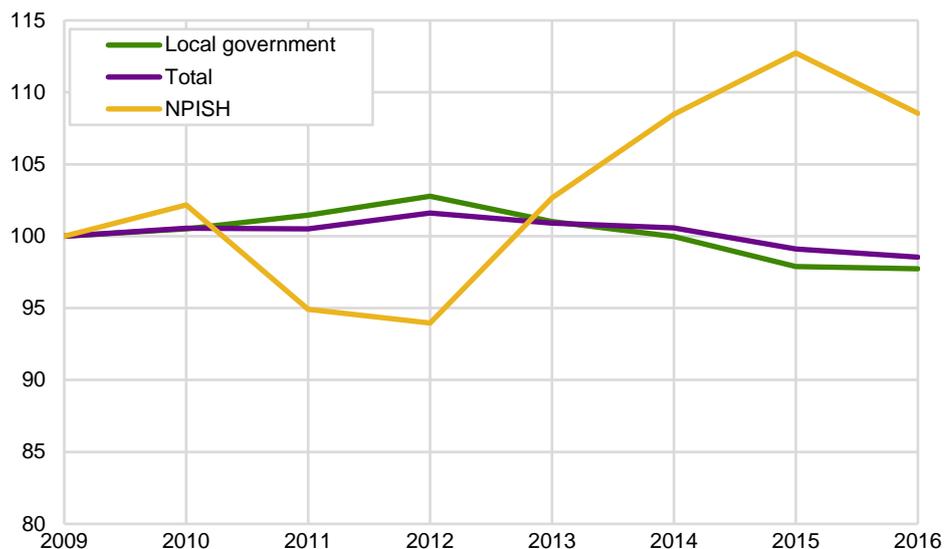
4. Testing new methods

4.1. Nursing and care in institutions

In the following, we test different variants of volume indicators, including quality adjustments. Finally, we conclude with what method we think will improve our current calculations the most, and which method will be implemented in our NA for the reporting year 2016.

4.1.1. Split private non-market and public institutions

For each institution, the volume data is linked with ownership information from the Central Register of Establishments and Enterprises. This allows us to split the NPISH and local government institutions.

Figure 4.1 Volume, local government and NPISH. 2009=100

The number of beds in public institutions should be used as a volume indicator for the local government. Similarly, the number of beds in the privately-owned institutions can be used as a volume indicator in the NPISH sector. This is a significant improvement compared to the current methodology, where input price indices are used in the NPISH sector, and the volume for the local government sector mistakenly included the NPISH-institutions as well.

4.1.2. Use both number of rooms and bed-days

More and more patients are staying in single rooms, which can be looked upon as an improvement in quality. This means that the number of rooms has increased more than the number of beds. To take this improvement into account, the expenditures related to the care service itself and expenditure related to the institution facilities are separated. The number of beds is used as a volume indicator for the care service. The number of rooms is used as a volume indicator for the institution facilities.

The figure below shows the volume using both beds and rooms, and only beds. There is almost no difference in the volume growth.

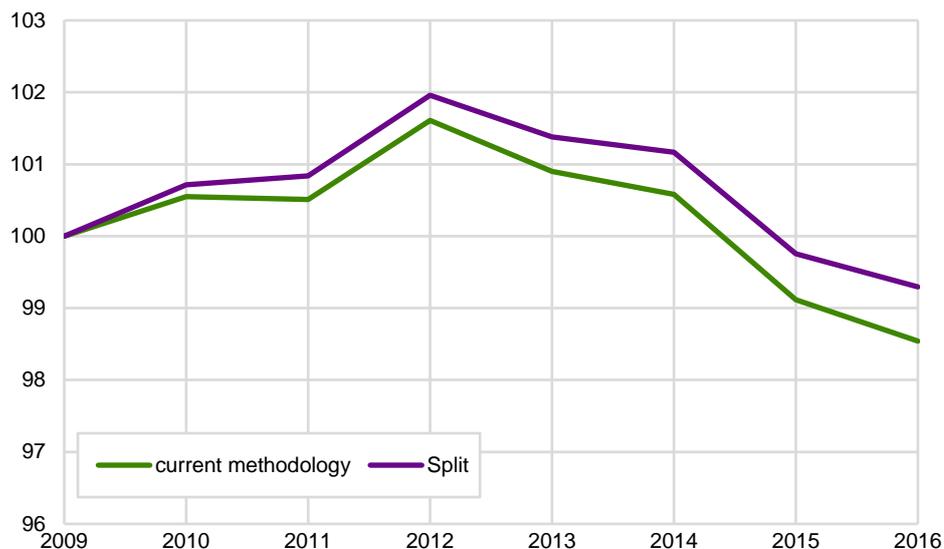
Figure 4.2. Volume, number of beds and rooms. 2009=100

4.1.3. Split old people's homes and nursing homes

Another weakness with the current methodology is that we do not distinguish between nursing homes and old people's homes, where no health services are provided. Thus, it is reasonable to assume that a bed in a nursing home is more expensive than a bed in an old people's home.

The volume data can be broken down by type of institution (nursing home vs. old people's home). This breakdown is not available for the financial data. However, cost weights are needed to aggregate the two volume indicators. To calculate the cost weights, an assumption about the price of a bed in a nursing home relative to a bed in an old people's home must be made.

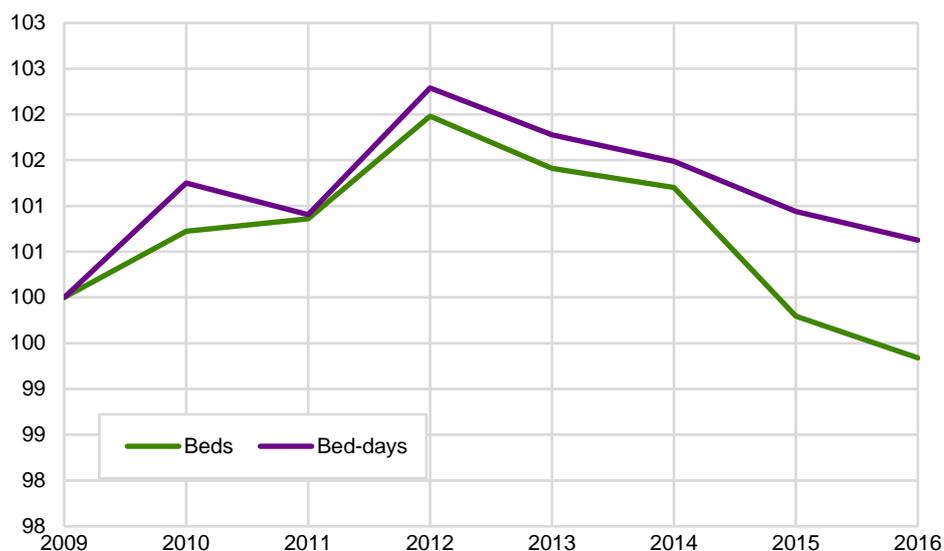
Cost weights are constructed based on a model by The Norwegian Association of Local and Regional Authorities (KS), The Enterprise Federation of Norway (Virke) and the Confederation of Norwegian Enterprise (NHO). The costs related to a bed in an old people's home is about 34 per cent lower than in a nursing home. Taking this into account, figure 4.3 below shows the effect of splitting the two types of institution. The effect is shown only for the overall numbers.

Figure 4.3 Split old people's homes and nursing homes. 2009=100

The number of beds in old people's homes have decreased more than in nursing homes. Nursing homes are more expensive, and consequently the volume development is lifted using the new method compared to the current one. For the final calculations, the overall cost ratio can be used for local government institutions and private non-market institutions separately.

4.1.4. Use 'bed-days'

In addition to number of beds, data on the number of bed-days are available. Using bed-days instead of beds increases the average volume growth from 2009 to 2016 moderately. Figure 4.4 shows the volume using beds and bed-days respectively. The nursing homes and old people's homes are separated using the same cost weights as in figure 4.2.

Figure 4.4 Number of beds and bed-days. 2009=100

4.1.5. Use number of bed-days by detailed service types

The number of bed-days can be broken down by type of stay. The different categories are:

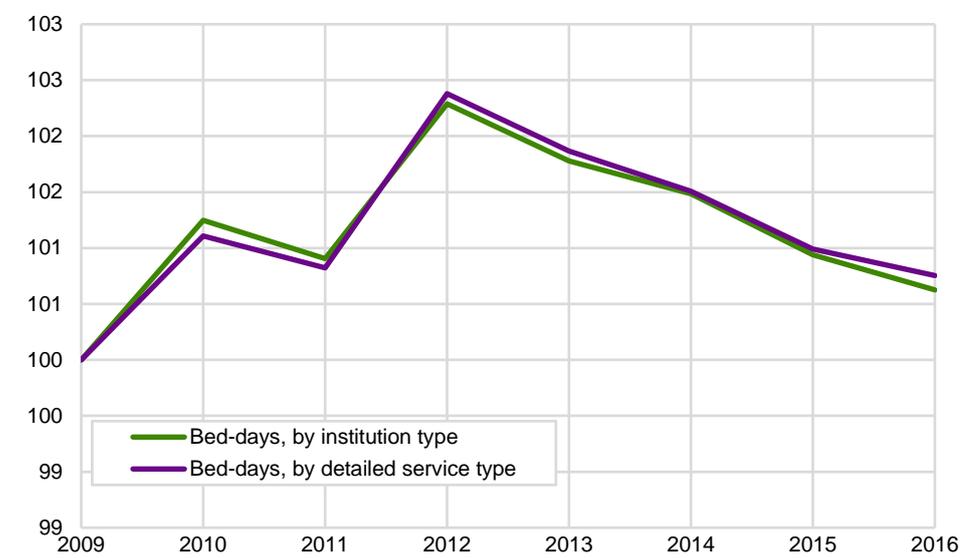
- **Respite care in institutions - not repeated**
- **Time-limited stay in institutions - health examination/treatment**
- **Time-limited stay in institutions - habilitation/rehabilitation**
- **Time-limited stay in institutions - other**
- **Long-term stay in institutions**

Two subcategories under “long-term stay in institutions” are constructed based on information about the number of beds in different institution types: “long-term stay - nursing homes” and “long-term stay - old people’s homes”.

This detailed breakdown of the output is a way to take the changes in quality into account. Patients on a time-limited rehabilitation stay typically require more physician hours, physiotherapist hours etc. than a patient on a long-term stay in a nursing home. Hence, the aforementioned quality indicators will most likely be captured by having this detailed breakdown.

Cost weights are constructed based on the aforementioned model by The Norwegian Association of Local and Regional Authorities. The figure shows the change in volume using total number of bed-days, and using number of bed-days broken down by type of stay. The calculations show that using a breakdown by type of stay gives almost the same result as the method using bed-days separated between nursing homes and old people’s homes.

Figure 4.5. Number of bed-days by detailed service type. 2009=100



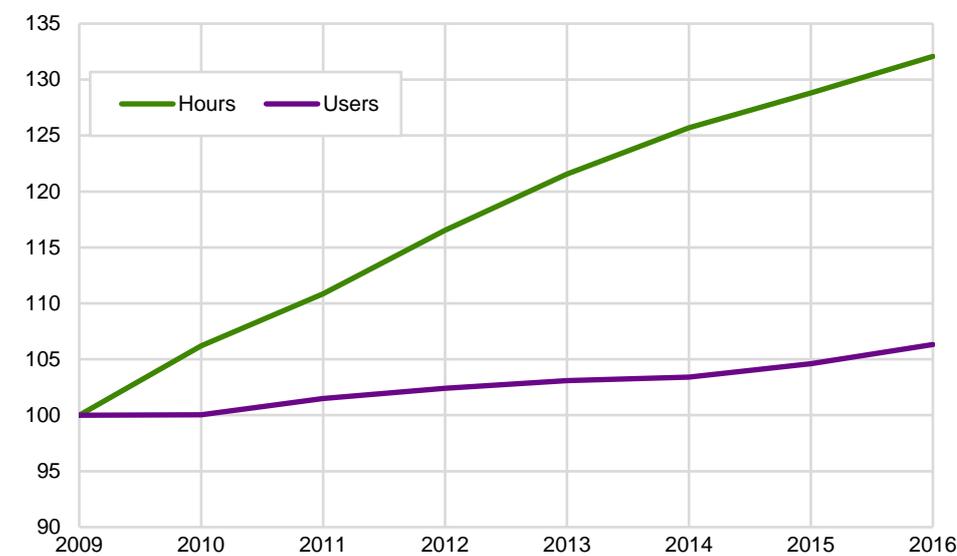
4.2 Home-based health and care services

4.2.1 Use number of assigned hours

The IPLOS register contains information about the number of hours assigned to each user. The average number of assigned hours to each user has increased considerably from 2009 to 2016. Using the total number of hours instead of users will increase the volume growth significantly. The figure shows the volume using the current methodology and the volume using number of assigned hours. The

average annual growth for the period 2009-2016 is 4.1 per cent for hours assigned and 0.9 per cent for number of users.

Figure 4.6 Home-based services, users and hours. 2009=100



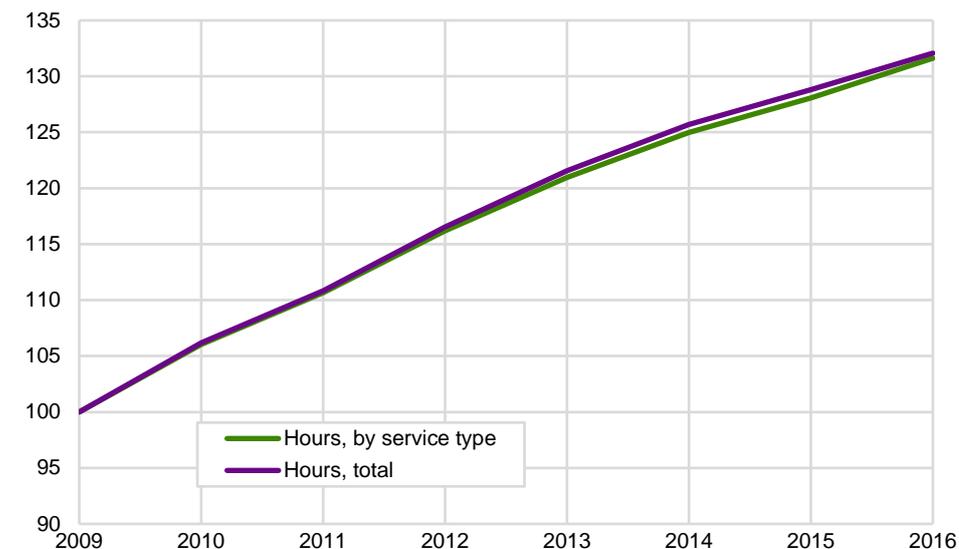
4.2.2 Use number of assigned hours, by type of service

The number of assigned hours can be broken down by type of service. For home-based services there are two distinct categories that are relevant: practical assistance and home nursing.

The financial data is not broken down by type of service. Cost weights used to aggregate the two volume indicators can be constructed based on average salaries from the A-melding given the following assumption: home nursing is performed by nurses and practical assistance is performed by personal care workers.

Data from the A-ordning is available for 2015 and 2016 only. Prior to 2015 we have similar data in other administrative registers but with less quality. We have consequently chosen to construct cost weights from 2009-2014 by using the figures from 2015 and extrapolating backwards using relevant wage indices.

The average salary for a nurse is higher than the average salary for a personal care worker. However, from 2009 to 2016 splitting the two service types changes does not change the volume growth significantly. It is probably not reasonable to assume that all home nursing is performed by nurses only, so the effect is probably even smaller. Our conclusion is that currently, distinguishing between professional nurses and lower skilled workers is not bringing additional quality to our calculations and will not be taken into account now. However, this is an issue that we will keep following and implement if necessary.

Figure 4.7 Hours, total and by service type. 2009=100

4.2.3. Split local government and NPISH

The data for the home-based services contains in principle information about the company providing the service. In theory, this could be used to split the private non-market and public providers. Unfortunately, this information is often missing. Work should be done to improve the quality of the ownership data. If this work is successful, the local government sector and NPISH should have separate volume indicators.

5. Conclusion

The volume for the institution services should be based on the number of bed-days instead of number of beds, and the calculation should be carried out at the most detailed level (by type of service, e.g. long-term stay, short-term stay, rehabilitation). The private non-market institutions and the public institutions should be separated. This will not cause a break in the time series, and the changes will be implemented in the annual national accounts for 2016. The time series from 2009-2015 will be revised in the in the next benchmark revision (2019).

For the home-based services, the number of assigned hours by type of service will be used to estimate the volume. More investigation is necessary to split the private non-market and the public providers.

Appendix

Table 1 Nursing and social care in institutions - current methodology. Change in volume. Per cent.

2010	2011	2012	2013	2014	2015	2016
0,55	-0,04	1,09	-0,70	-0,32	-1,46	-0,58

Table 2 Home-based health and care services – current methodology. Change in volume. Per cent.

2010	2011	2012	2013	2014	2015	2016
0,05	1,45	0,90	0,66	0,33	1,14	1,65

Table 3 Nursing and social care in institutions, by sector. Change in volume. Per cent.

	Local government	NPISH	Total
2010	0,51	2,17	0,55
2011	0,95	-7,11	-0,04
2012	1,29	-0,99	1,09
2013	-1,72	9,26	-0,70
2014	-1,02	5,65	-0,32
2015	-2,09	3,93	-1,46
2016	-0,16	-3,72	-0,58

Table 4 Nursing and social care in institutions. Change in volume using number of beds and rooms. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Beds and rooms	0,54	-0,02	1,08	-0,67	-0,28	-1,40	-0,55
Beds	0,55	-0,04	1,09	-0,70	-0,32	-1,46	-0,58

Table 5 Nursing and social care in institutions. Split nursing homes and old people's homes. Change in volume. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Current methodology	0,55	-0,04	1,09	-0,70	-0,32	-1,46	-0,58
Split	0,72	0,13	1,11	-0,56	-0,20	-1,39	-0,46

Table 6 Nursing and social care in institutions. Change in volume using number of beds and bed-days. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Beds	0,72	0,13	1,11	-0,56	-0,20	-1,39	-0,46
Bed-days	1,25	-0,34	1,37	-0,50	-0,29	-0,54	-0,31

Table 7 Nursing and social care in institutions. Change in volume using number of bed-days by detailed service type. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Bed-days, by institution type	1,25	-0,34	1,37	-0,50	-0,29	-0,54	-0,31
Bed-days, by detailed service type	1,11	-0,28	1,54	-0,50	-0,35	-0,51	-0,24

Table 8 Home-based health and care services. Change in volume using number of assigned hours and number of users. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Hours	6,19	4,38	5,14	4,31	3,39	2,48	2,53
Users	0,05	1,45	0,90	0,66	0,33	1,14	1,65

Table 9 Home-based health and care services. Change in volume using total number of hours and number of hours by service type. Per cent.

	2010	2011	2012	2013	2014	2015	2016
Hours, by service type	6,02	4,36	5,03	4,10	3,33	2,46	2,77
Hours (total)	6,19	4,38	5,14	4,31	3,39	2,48	2,53

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ISBN 978-82-537-9775-5 (electronic)



Statistisk sentralbyrå
Statistics Norway

Design: Siri Boquist