

The effect of public subsidies for formal care on the care provision for disabled elderly people in France

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Abstract

This paper aims to address the question of whether public support for the use of professional home care leads to a decline in family support. The potential crowding out effect is investigated in the French context to assess how the receipt of the APA changes the care received by disabled elderly. We outline a statistical comparison of the APA recipient population from the APA non-recipient population with respect to the care they received. We control observed heterogeneity between the two sub-populations by using the matched sampling method. Our results suggest that the use of publicly funded formal care does not result in a general massive withdrawal of family. This finding is consistent with previous literature in France but also in each country where this question has been addressed. We found however that the degree of substitution between public and family support is sensitive to the presence of a partner and elderly needs. From this point of view, the involvement of disabled elderly's partner appears to be strongly associated with the use of publicly funded formal care, particularly when the elderly needs are low, meaning that they potentially can be supported solely by informal care or solely by formal care. In this case, informal care from partner appears as a clear alternative to the use of formal care.

Key words : Long-term care ; informal care ; public subsidy ; crowding-out effect ; matching

JEL Classification : D13, H24, H51, I18, J14

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1 Introduction

With the population ageing, a growing number of individuals need assistance to perform activities of daily living. In light of this observation, one of the main objectives of European policymakers is to maintain disabled elderly people in the community for as long as possible. The implementation of this objective raises the issue of how the responsibilities related to elder care are shared between family and the state. In many countries, family is the main provider of care for disabled elderly people. Existing surveys consistently estimate that informal care represents at least 80% of the total care (in volume) received by disabled elderly people (OCDE, 2005). However, informal provision of care may lead to adverse private and social effects. One of these adverse effects is a reduction in the labour supply (Crespo, 2006; Bolin et al., 2008). Another is a possible decline in the caregiver's health. Previous literature suggests that providing care increases symptoms of depression and the incidence of heart conditions (Coe and Van Houtven, 2009).

Policymakers have a strong interest in participating in the provision of care, both to reduce the risk of institutionalisation induced by an eventual rupture of the informal care arrangement and to alleviate the burden on informal caregivers. One possibility is to provide publicly funded formal care. In 2002, the French government introduced the personalised autonomy allowance (allocation personnalisée d'autonomie, or APA) to encourage the use of professional home care workers. APA is a form of public financial support intended for individuals over 60 years old, who need assistance to perform activities of daily living (ADLs). Over 90% of recipients use the public allowance for financing professional services, such as home help, personal care (e.g., bathing and dressing) or home surveillance. The allowance can also be used to remunerate an informal caregiver (other than the recipient's partner) or to finance assistive technologies and home accessibility modifications¹. In 2009, approximately 1,100,000 disabled elderly people benefited from the public allowance (Debout and Lo, 2009). APA-related expenditures amounted the same year to 5.1 billion Euros and represented 23% of the public financial support for disabled elderly people, which was estimated to be 21.6 billion Euros (1.1% of the French DGP) (Rosso-Debord, 2010).

The aim of this paper is to analyse how the use of APA impacts the care received by disabled elderly people living at home. In particular, we examine whether publicly funded formal care substitutes for informal care. This issue refers to the well-known "crowding-out effect", which involves the substitution of public transfers for private ones. In the context of the care provided to the disabled elderly, the crowding-out effect is not necessarily an unwanted consequence from the policymaker's perspective if the allowance aims to alleviate the burden of informal caregivers. However, if the purpose of the public allowance is to complement the pre-existing family support by public support and increase the total care provided, a crowding-out effect would dilute the efficacy of the public policy.

¹See Fontaine (2011) for a more detailed presentation of APA.

We use data from the *Handicap-Santé Ménage* (HSM) survey to assess the effect of APA receipt on the care received by beneficiaries. Our methodological approach consists of comparing the APA recipient population with the non-APA recipient population with respect to the care they received from both formal and informal caregivers. We control observed heterogeneity between the two sub-populations by using the propensity score matching method.

The rest of this paper is organised as follows : Section 2 reviews the previous literature ; Section 3 presents the data used in the analysis ; Section 4 proposes an empirical analysis of the determinant of the recourse to the APA ; Section 5 outlines the empirical strategy we use to investigate the effect of the public allowance on the care provision ; Section 6 provides the results ; and finally, Section 7 concludes.

2 Previous literature

To the best of our knowledge, only two studies investigate the effect of public support on the care received by disabled elderly people in France. The first study was conducted using data collected by the DREES only one year after the introduction of the APA. Based on a representative sample of 2,614 beneficiaries, Petite and Weber (2006) compare the care APA recipients received at the time of the survey to the care they received prior to benefiting from the APA. They conclude that family involvement in care is stable. Moreover, in families where the provision of care is impacted by the receipt of the APA, Petite and Weber observe that household chores are the main care activities that are delegated by informal caregivers to formal caregivers. However, the method used may have underestimated the true effect of receiving the APA on informal provision for at least two reasons. First, the data related to the care that the beneficiaries received prior to the receipt of the APA are retrospective. The authors suggest that the respondents may have underestimated the change in informal care induced receiving the APA and thus assimilated the care they received before benefiting from the APA into the care they received afterwards. The respondents may also have been embarrassed to acknowledge that their family provides less care than they did earlier. Second, if elderly people's needs increase with time, identifying the effect of the treatment (i.e., the receipt of the APA) through a simple comparison of the care provided by family before and after treatment probably leads to an underestimate of the true treatment effect. We can indeed assume that the care they received before benefiting from the APA (when they were probably less dependent) underestimates the care they would receive today if they were not APA beneficiaries. Using different data and a different empirical approach, Rapp *et al.* (2011) study whether benefiting from the allowance is associated both with greater use of formal care and with less informal care as a proportion of total care. Their analysis focuses on people with Alzheimer's disease and is based on a cross-sectional sample of 1,131 French elderly patients. The results suggest that receiving

the APA is associated both with an increase in the total number of care hours and with a significant (13%) decrease in the proportion of total care consisting of informal care. Informal care still represents more than 80% of the total care use among those who benefit from the allowance. However, these results are related to a specific population suffering from Alzheimer’s disease, and their needs are probably not representative of the overall APA recipients. Furthermore, the patients were required to have a primary informal caregiver to participate in the survey. Therefore, it was not possible to assess how receiving the APA affected the likelihood of receiving informal care. Finally, the survey only examined the informal care provided by the primary informal caregiver, and 29% of APA recipients receive care from several informal caregivers (Petite and Weber, 2006).

Outside of France, several studies deal with the effect of public support on informal care. This literature also provides mixed results. Christianson (1988) and Pezzin *et al.* (1996) both examine data from the Channelling experiment, an assessment of public financing for home care that took place in the US during the 1980s. Christianson (1988) finds that an increase in the provision of formal care is not associated with a significant decline in informal care. In particular, the author finds that primary caregivers maintain their total level of involvement in the presence of formal services, but tend to concentrate their involvement in certain areas. Using the same data but modelling living and care arrangements together, Pezzin *et al.* (1996) find that increased use of publicly funded formal care leads to a slight decrease in the provision of informal care. In another US study, Ettner (1994) assesses whether Medicaid home care benefits affect the probability of entering a nursing home and the use of formal and informal home care. Using data from the National Long-Term Care Survey, the author finds evidence that home care subsidies reduce the rate of nursing home entry. Among disabled elderly people living in the community, moreover, Ettner identifies a substitution between informal care and formal non-medical care. Using data from the National Population Health Survey and General Social Survey in Canada, Stabile *et al.* (2006) examine whether differences in the availability of publicly funded home care between provinces is associated with differences in individual utilisation of formal and informal care and with self-reported health status. Their results suggest that increased availability of publicly financed home care is associated with an increase in its utilisation, a decline in the provision of informal care and an improvement in self-reported health status. Using data from urban populations in Norway, England, Germany, Spain and Israel, Motel-Klingebiel *et al.* (2005) observe that the total volume of care received by elderly people from both formal and informal caregivers is greater in countries with a strong infrastructure of formal services. Moreover, they do not find evidence of a substantial “crowding-out effect” on family care due to publicly funded formal care. By contrast, Viitanen (2007) uses data from the European Community Household Panel (1994-2001) and finds that increased long-term care expenditures are associated with a decline in the informal care provided by non-co-residents.

As mentioned by Bonsang (2009), the recent literature addresses the issue of reverse causality by examining how the provision of informal care affects the use of formal care after controlling for endogeneity. From this

point of view, studies usually find that informal care is a substitute for formal care. Van Houtven and Norton (2004) estimate the effect of providing informal care on Medicare expenditures in the US. Using data from the Asset and Health Dynamics Among the Oldest-Old Panel Survey and the Standard Analytic Files of Medicare Claims expenditures, they find that informal care provided by children reduces the Medicare expenditures related to long-term care, especially among recipients who are married. However, the results also show that the decrease in Medicare expenditures on long-term care is relatively small (only \$2.42 per hour of informal care). Using data from SHARE (Survey on Health, Ageing, and Retirement in Europe), Bolin *et al.* (2008) and Bonsang (2009) also find that informal care is a substitute for formal home care. However, Bonsang (2009) finds that the relationship between formal and informal care varies according to the needs of the elderly. In particular, the substitution appears to only be significant for elderly people suffering from heavy disability.

Holly *et al.* (2010) have recently compared the relationship between formal and informal care in the US and in Europe. Using data from the Health and Retirement Study (for the US) and SHARE (for Europe), they develop a simultaneous equation model that allows them to jointly estimate both the direct effect of informal care provided by children on formal care and (vice versa) the direct effect of formal care on informal care provided by children. They first observe that the substitution effects are larger in the US than in Europe. They also find that in Europe, children tend to consider the amount of formal care received by their elderly parent before making their caregiving choices, while in the US, elderly parents seek formal care when the informal care received from their children does not cover their needs.

Overall, the main conclusion we can draw from this literature review is that we do not observe a strong crowding-out effect from publicly funded formal care on the provision of informal care, regardless of the country in question. In fact, all the studies that find that public support displaces informal care also find that this substitution is actually modest. However, recent studies that address the reversal causality (i.e., the effect of the provision of informal care on the use of professional home care services) find evidence that the interaction between informal and formal care is sensitive to certain characteristics of the elderly, such as the disability level and the family configuration. We propose to extend the existing literature by using recent French data from the HSM survey. The HSM survey is one of the richest sources of data on the informal and formal care received by the disabled elderly in France. Unlike the data used by Rapp *et al.* (2011), it allows us to address the effect of the APA on a representative sample of disabled elderly and on total informal care (not on the care provided by the primary caregivers only). Our empirical method is based on a statistical comparison of the care received by the APA recipients with the care received by a control group of non-APA recipients. We use the matched sampling method proposed by Rosembaum and Rubin (1985), which allows us to produce a control group of non-APA recipients that is similar to the group of APA recipients with respect to the distribution of observed covariates. Following recent results from Van Houtven and Norton (2008) and Bonsang (2009), moreover, our empirical analysis proposes to identify the effect of publicly funded formal

care on informal care according to two criteria : (i) the disability level and (ii) the household configurations of the elderly individuals. Before presenting our empirical approach, the next section outlines the data used.

3 Data

To study the determinants of the use of the APA and associated effects on the care received by disabled elderly people living at home, we use data from the Handicap-Santé Ménage (HSM) survey. The HSM survey was conducted in France by the INSEE and DREES in 2008. In addition to the main information linked to the socio-demographic characteristics of the individuals surveyed and their families, the HSM survey collected information regarding these individuals' disability levels and the professional and informal care that they receive to assist them in performing the main activities of daily living. The survey allows us to identify APA recipients and thus to study both the determinants of recourse to the APA and the effects of the allowance on the assistance received by the recipients.

Our initial sample includes 9,927 individuals over the age of 60. However, most of these individuals do not experience any difficulties or inabilities in performing the activities of daily living (ADLs) or instrumental activities of daily living (IADLs). To measure the disability levels of the respondents in this study, we use the Katz index² (Katz *et al.*, 1970 ; Katz, 1983). According to one's ability to perform the ADLs without assistance, the Katz index defines eight levels of disability :

- Group A : The person can perform the six following activities independently : "bathing", "dressing and undressing", "toileting", "transferring", "eating and drinking once the food is ready", "lying down in or getting out of bed and sitting down in or getting up from a chair" and "controlling bowel movements and urination".
- Group B : The person can perform five of the six activities independently.
- Group C : The person requires assistance for two activities, including "bathing".
- Group D : The person requires assistance for three activities, including "bathing" and "dressing and undressing".
- Group E : The person requires assistance for four activities, including "bathing", "dressing and undressing" and "toileting".
- Group F : The person requires assistance for five activities, including "bathing", "dressing and undressing", "toileting" and "transferring".
- Group G : The person requires assistance for all six activities.

²The GIR classification used to assess officially the eligibility for APA of the applicants is also available in the database, but it is associated with a number of inconsistencies that are being studied by the DREES.

- Group H : The person requires assistance for at least two activities but does not meet the criteria for the previous categories.

The Katz index is solely based on the inability to perform ADLs without assistance. However, some individuals may report difficulties in performing certain ADLs or IADLs, even if they are capable of performing all ADLs without assistance. Therefore, we distinguish among the individuals in Group A based on the Katz index : those who do not experience any difficulties in performing ADLs or IADLs, denoted as “Group A-“, and those who experience difficulty in performing at least one ADL or IADL, denoted as “Group A+“. Table 1 outlines the weighted distribution³ of individuals over 60 years of age according to their disability level. Seven out of 10 individuals over 60 years of age are fully independent, whereas 3 out of 10 individuals report experiencing difficulty in performing at least one ADL or IADL. The majority of these individuals are classified as slightly disabled. In particular, less than 4% of the population over 60 is characterised by the inability to perform at least one ADL without assistance.

Table 1. Weighted distribution of individuals over 60 by level of dependence
(Katz index)

	All	Dependent only
A- (fully self independent)	71.7%	-
A+ (slightly disabled)	24.4%	86.2%
B-C-H (moderately disabled)	2.6%	9.3%
D-E (highly disabled)	0.5%	1.7%
F-G (severely disabled)	0.8%	2.8%

Within our sample, 9% of the individuals over 60 years of age living in the community received the APA ; this figure equates to 4% of the population represented by the sample. The proportion of recipients appears to strongly increase according to the dependency levels of individuals, from 8% for slightly disabled individuals to 70% for very highly disabled individuals (Figure 1). The same heterogeneity appears with regard to age (Figure 2). The proportion of APA recipients, which is less than 5% among individuals between 60 and 80 years old, increases with age until reaching its maximum of 30% among those over 95 years old.

³In the HSM sample, individuals presenting incapacities are overrepresented as compared with the general population. The numbers presented in this section are weighted. Therefore, they are relative to the population represented by the sample.

Figure 1. Proportion of APA recipients by level of dependency

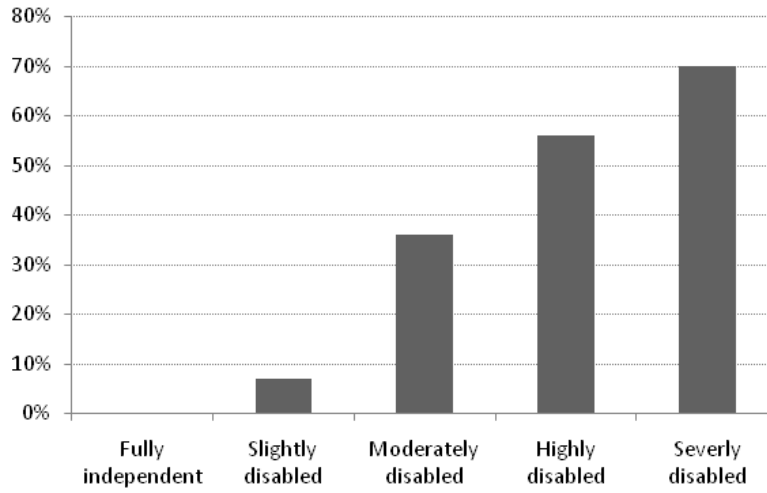


Figure 2. Proportion of APA recipients by age

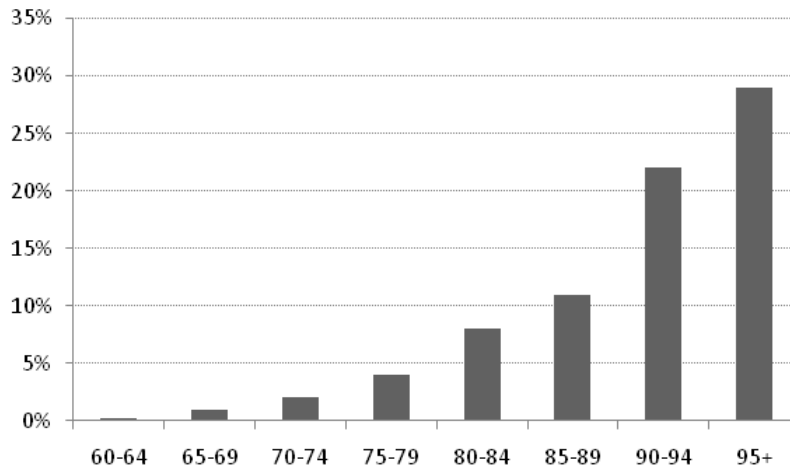


Table 2 presents a comparison of the main characteristics of APA recipients (gender, age and marital status) within the HSM sample and the 500,000 APA beneficiaries from the survey of "APA individual data 2006-2007" (Debout, 2010). These administrative data were collected by the DREES from the general councils of representative departments, and they allow us to ensure that our sample is representative of APA recipients at the national level. Similar to the sample from the APA individual data from 2006-2007, the recipients of the allowance in our sample are primarily women. In addition, the average age of the APA recipients was 82 years (83 in the 2006-2007 study), and about one in three recipients live with a partner⁴.

⁴The proportions of male and female recipients living with a partner differ significantly : 63% (61% in our sample) of men live with a partner as compared with 25% (25% in our sample) of women.

Table 2. Comparison with "APA individual data 2006-2007" survey (only APA recipients)

	HSM	"APA individual data 2006-2007 survey"*
Proportion of women	72%	74%
Average age	82 years	83 years
Proportion living with a partner	35%	35%
	(Men : 61% ; Women : 25%)	(Men : 63% ; Women : 25%)

We exclude from the rest of the empirical analysis all fully self independent individuals (i.e. individuals who belong to "Group A-") and focus the analysis on the two following sub-populations :

- The slightly disabled sub-population, which includes all individuals who experience difficulty (but not inability) in performing at least one ADL or IADL (i.e., individuals who belong to "Group A+ of the Katz index").

- The highly disabled sub-population, which includes all individuals who report an inability to perform at least one ADL without assistance (i.e., individuals who belong to Groups B, C, D, E, F, G or H of the Katz index).

Moreover, because our empirical analysis aims to study the effect of professional care funded by the intermediary of the APA on the care received by the recipients, we exclude from our analysis those APA recipients who used the allowance to pay for an informal caregiver (7% of the APA recipients in our sample) or to finance assistive technologies or home accessibility modifications (1% of the APA recipients in our sample).

The final sample includes 4256 observations. Table A1 in Appendix A reports the distribution of all covariates used in the analysis.

4 Main determinants of recourse to the APA

Figure 1 shows that the use of the APA is far from systematic among disabled individuals. Even among the individuals identified as highly disabled (Groups F and G according to the Katz index), only 70% resort to using the APA. Arrighi *et al.* (2010) described various factors that may explain the lack of APA use. First, elderly people (and their families) may not be aware of the program. Moreover, the implicit costs associated with recourse to the allowance may be prohibitive with regard to the expected benefits. For example, the expected advantages may be considered modest for individuals with high incomes for whom the out-of-pocket cost may represent 90% of the Care Plan defined by the social medical team (see Fontaine, 2011)). Conversely,

the use of the APA may be accompanied by costs for beneficiaries who may view the use of the APA as an unwanted social acknowledgement of aid dependency, for those who do not want to change from a pre-existing care organisation, or for those who refuse any external intrusion of the social medical team or professional services.

To the best of our knowledge, with the exception of the study by Arrighi *et al.* (2010), which mainly focused on the possible price effect of APA requests, no quantitative studies have attempted to identify the individual determinants of recourse to the APA. Before assessing the effect of public allocation on the care received by the recipients, this section outlines the main factors associated with recourse to the APA⁵. Using data from the HSM, Table 3 reports estimation results from a Probit model.

Women appear more likely to resort to the APA than men. The positive effects of age and disability level on the probability of resorting to the allowance are confirmed *ceteris paribus*. In particular, those experiencing difficulties in preparing meals, doing household chores, doing administrative work or bathing have a higher propensity to resort to the APA.

Moreover, self-reported health status is negatively correlated with the probability of resorting to the APA, whereas those suffering from Alzheimer disease are more likely to benefit from the APA, the effect being however only significant at the 16% level.

Two variables potentially related to informal care resources show significant effects on the propensity to resort to the APA, corresponding to the trend that having a greater number of informal care resources available to disabled elderly people is associated with a lower probability of recourse to the APA. First, elderly people living with a partner or living with a child resort to the APA less often than individuals living alone. From this point of view, individuals living with both a partner and at least one child have the lowest probability of resorting to the APA. Second, the number of children is significantly associated with recourse to the APA. Nevertheless, the effect varies according to the gender of children. Having daughters decreases the probability of resorting to the APA whereas the number of sons of an elderly person has the opposite effect, suggesting that son may encourage their parents to resort to the APA.

As expected, the household standard of living is negatively associated with the probability of resorting to the APA. Because the out-of-pocket costs increases with the household standard of living, the allowance provides lower financial benefit to the wealthiest individuals. Moreover, individuals living in rural areas are characterised by a higher probability of benefiting from the APA. This result may highlight the effect of the size of the market for “over-the-counter” professional caregivers, which is likely to be less developed in rural areas or small towns as compared with large cities. When possible, the employment of privately financed “over-the-counter” home care workers can constitute an alternative to using publicly funded home

⁵Table A1 in Appendix A outlines the covariates used in the analysis.

care service providers. Finally, overseas respondents report that they benefit from the APA less frequently than others.

Table 3. Estimated coefficients (Probit model) - Probability of benefiting from the APA

Constant	-9.94***(1.84)
Gender	ref.
Woman	0.14**(0.06)
Man	ref.
Age	0.19***(0.05)
Age ²	-0.001***(<0.001)
Household configuration	
Living alone	ref.
Living with a partner	-0.35***(0.06)
Living with a child	-0.17*(0.09)
Living with a partner and a child	-0.61***(0.15)
Living with other	-0.26*(0.15)
Number of daughters	-0.05***(0.02)
Number of sons	0.04* (0.02)
Standard of Living (in thousands of Euros)	-0.12*** (0.04)
Rural area	
No	ref.
Yes	0.21*** (0.06)
Department	
Overseas departements	-0.49****(0.009)
Others	ref.
KATZ index	
A	ref.
B or C	0.52***(0.08)
D or E	0.79*** (0.13)
F or G	0.99*** (0.14)
H	0.40** (0.16)
ADLs (reporting difficulties in performing)	
Bathing	0.31***(0.07)
Dressing and undressing	0.01 (0.08)
Cutting food and pouring a drink	-0.06 (0.08)
Eating and drinking on the food is ready	0.04 (0.15)
Toileting	0.06 (0.09)
Lying down in or getting out of the bed	0.10 (0.10)
Sitting down in or getting up from the chair	0.05 (0.10)
IADLs (reporting difficulties in performing)	
Shopping	0.01 (0.08)
Preparing meals	0.30***(0.07)
Doing common household chores	0.48***(0.07)

(standard errors are given in parentheses)

continued...

Table 3. Estimated coefficients (Probit model) (continued)

Doing less common chores	0.15*(0.08)
Doing administrative works	0.14**(0.07)
Taking medications	0.06 (0.08)
Moving around in all of the rooms on a floor	-0.07 (0.09)
Leaving your home	0.07 (0.07)
Using a method of transportation	-0.01 (0.07)
Finding its way	0.05 (0.08)
Using a telephone	0.03 (0.09)
Using a computer	0.04 (0.07)
Self-reported health status	
"Bad" or "very bad"	0.20***(0.06)
"Pretty good"	ref.
"Good" or "Very good"	-0.21*(0.12)
Alzheimer disease	
No	ref.
Yes	0.13 (0.09)

(standard errors are given in parentheses) n=4256

5 Effects of the APA on care received : an empirical approach

From a theoretical point of view, public subsidies, such as the APA, reduce the cost of professional care and are expected to change the distribution of care resources used for formal and informal care toward an increase in formal care utilisation and, if the two factors of production are substituted, a decrease in informal care utilisation⁶. However, the intensity of this change is unclear and may vary from one individual to another.

The effect of public financial support on formal care utilisation primarily depends on the price elasticity of formal care demand. For some individuals, a reduction in formal care costs can empirically result in a high increase in formal care utilisation. For example, slightly disabled people living with a partner are likely to be characterised by a highly elastic formal care demand if they choose informal care resources rather than professional services when they do not receive public financial support. In contrast, highly disabled elderly people living alone may be characterised by rather inelastic formal care demands because these individuals are likely to use formal care even without public financial support. The effect on informal care utilisation is also unclear. This effect primarily depends on the care production function and the degree of substitution between informal care and formal care. This effect may also depend on the individual preferences of disabled elderly people, who may place different values upon informal care and formal care, or the preferences of family members who may have difficulty, according to normative motives, withdrawing from providing care, even if the disabled relative may benefit from professional care.

⁶For a formalised framework, the reader may refer to Stabile et al. (2006). Although developed in the Canadian institutional framework, the proposed model appears to be relatively appropriate for theoretical research on the effect of the APA on the care received by the recipients.

Our empirical analysis aims to study the effect of professional care funded by the intermediary of the APA on the care received by the recipients, particularly on the care that they receive from their family environment⁷. The use of the APA can affect the care received in three distinct ways. First, the allowance can affect the care arrangement (i.e., the use of formal care and/or informal care). Some disabled elderly people may use professional services only when they benefit from public financial support or use informal care only when they do not benefit from public financial support that would allow them to pay for formal care. Second, receiving the APA may not affect the use of informal or formal caregivers but may affect the intensity of the care provided by both types of care providers. Finally, benefiting from the APA may not affect the intensity of the care provided but may modify the care activities in which caregivers are involved. For instance, receiving the APA may reduce the involvement of informal caregivers in activities such as cleaning the house in favour of a higher involvement in ensuring a presence or companionship for the elderly. Thus, we consider three different outcomes (Y_k , $k = 1, 2, 3$) related to informal care or formal care in our analysis : (i) the use of informal care (resp. formal care), represented by a dummy variable equal to 1 if the APA recipient receives informal care (resp. formal care) and 0 otherwise ; (ii) the intensity of informal care (resp. formal care) conditional on receiving informal care (resp. formal care), represented by a variable corresponding to the total number of informal care (resp. formal care) hours received per week by the APA recipient ; and (iii) the range of the informal care (resp. formal care) received, represented by a variable measuring the number of care activities in which informal caregivers (resp. formal caregivers) are involved.

To empirically investigate how publicly funded formal care affects the care received by disabled elderly people and how the effect varies between individuals, we use the analytic framework proposed by Rubin (1974, 1979). Let APA be a dummy variable equal to 1 if an individual resorts to the APA and 0 if not, and let Y_{1ki} denotes the care outcome k when i resorts to the APA and Y_{0ki} denotes the care outcome k when i does not resort to the APA. Our analysis aims to compare the care received by the APA recipients ($Y_{1ki}/APA_i = 1$) to the care they would have received if they were not recipients of the allowance ($Y_{0ki}/APA_i = 1$). Among the recipients of the allowance, the average effect of the APA on a given care outcome Y_k , ATT_k , can be defined as follows :

$$ATT_k = E(Y_{1ki}/APA_i = 1) - E(Y_{0ki}/APA_i = 1)$$

The care that the APA recipients would have received if they were not recipients of the allowance is obviously unobservable. However, as previously noted, recourse to the APA is not systematic among individuals over the age of 60 who need assistance to perform the ADLs and IADLs. Thus, it is possible to estimate

⁷As previously mentioned, our analysis is partial because the APA does not allow the funds to be used solely for professional home care even if the majority of recipients (92%) use the allowance for this purpose. In addition, 7% of the APA recipients use the allowance to remunerate an informal caregiver (other than their partner) and, in a small number of cases (1%), to finance assistive technologies or home accessibility modifications. We excluded from our analysis those APA recipients who used the allowance to pay for an informal caregiver, financial assistive technologies or home accessibility modifications to focus on the effect of using publicly funded professional home care.

the average level of care that the APA recipients would have received if they were not recipients of the allowance, $E(Y_{0ki}/APA_i = 1)$, using the care received by the non-recipients, $E(Y_{0ki}/APA_i = 0)$. However, this estimation is likely to be biased because the expectation of care received by the APA recipients if they were not recipients of the allocation is expected to be different from the care that is actually received by non-recipients : $E(Y_{0ki}/APA_i = 1) \neq (E(Y_{0ki}/APA_i = 0))$.

In our sample, the use of the APA is neither random nor exogenous. As noted in Section 4, the use of APA depends on individual and family characteristics. Recourse to the APA is part of a choice whose determinants are distributed unequally among recipients and non-recipients. Using the care that the non-recipients of the APA receive to estimate the care that the recipients of the allowance would have received if they did not benefit from the allowance could thus attribute the pre-existing differences between both populations to the APA effect. However, the main determinants of the choice to resort to the APA, such as disability levels or household configurations, are observed in our data and allow for comparing APA recipients with non-APA recipients who exhibit the same observed determinants of choice.

We use the matched sampling method proposed by Rosebaum and Rubin (1985). This method allows us to select units from a large “reservoir” of potential controls to produce a control group that is similar to the treated group with respect to the distribution of observed covariates. The cause of one individual in a matched couple receiving the APA while the other individual does not is assumed to depend on unobserved factors. Our empirical analysis is based on the additional assumption that these unobserved factors are randomly distributed in the population. This assumption implies, conditional on the observed individual and family characteristics, benefiting from the APA is orthogonal to the care received without the APA (that is, that $E(Y_{0ki}/APA_i = 1, X_i) = E(Y_{0ki}/APA_i = 0, X_i)$). This “conditional independence assumption” (Heckman *et al.*, 1997) allows us to estimate the effect of the APA by comparing a given care outcome for each APA recipient with the care outcome of a non-APA recipient whose values in the vector of observed characteristics are identical.

Some issues must be addressed. The first issue concerns the matching procedure. Ideally, it would be optimal in this analytic framework to match each APA recipient with a non-APA recipient having the same set of observed characteristics. However, the size of our sample does not allow us to dispose of individuals with identical observed characteristics. Therefore, our matching procedure is based on the propensity score (Rosenbaum and Rubin, 1983, 1985). The propensity score corresponds here to the probability of benefiting from the APA, which can be simulated for each individual of our sample with the Probit model presented in Section 4. We then estimate the care outcome counterfactual (without APA) for each APA recipient with the observed care outcome of the nearest non-APA recipient with regard to his or her propensity score⁸. However, the propensity score matching can lead to the matching of individuals with clearly different observed

⁸We have used the STATA module `psmatch 2` (Leuven and Sianesi, 2003).

characteristics, even though their propensity scores are similar. For example, age and living alone are two factors positively associated with the probability of having recourse to the APA. Therefore, we can imagine a situation in which an APA recipient living alone is matched with an older non-APA recipient who lives with a partner and who has a very close propensity score. Such a match would be problematic in this case because the informal care received by the non-APA recipient does not appear to be a credible counterfactual. To limit this risk, we constrain the matching procedure to only associate individuals having both (i) a similar disability level, by distinguishing slightly disabled individuals from highly disabled individuals, and (ii) a similar marital status, by distinguishing the individuals living with a partner from those not living with a partner⁹.

Second, our matching procedure is solely based on the observed characteristics. Thus, the presence of unobserved heterogeneity may bias the estimate if these unobserved factors simultaneously affect utilisation of the APA and the care outcomes. The health status of a disabled elderly person’s partner is one of the main unobserved factors that may simultaneously explain both the decision to apply for the APA and informal care utilisation. Disabled individuals who have a partner who is in poor health or has disabilities are likely to receive less informal care, as the partner is generally the main caregiver; they are also likely to have more incentives to benefit from publicly funded formal care that may benefit both individuals. From this perspective, failing to consider the ability of a partner to provide care could lead to an overestimation of the decrease in informal care induced by utilising the APA. Results we present here do not take into account the potential presence of unobserved heterogeneity. However, previous literature suggests that our results related to informal care are not driven by unobserved heterogeneity. Indeed, Rapp et al. (2011) test the exogeneity of the APA benefit and results lead them not to reject the hypothesis that the use of publicly funded formal care in France is exogenous with respect to the provision of informal care. This result is also consistent with the results of Holly et al. (2010), who find that in Europe, the care provided by children does not affect the formal care received by elderly parents. To extend this work we plan to validate the exogeneity of the use of APA by using an instrumental variable (IV) approach. Specifically, we plan to simultaneously estimate two equations : one equation for benefiting the APA, and one equation for the informal care outcome of interest, including a dummy variable indicating whether an individual from the APA. As the instrumented variable, i.e. benefiting from the APA, is not a linear combination of the instrumental variables, the model is theoretically identifiable without exclusion restrictions. Following Arrighi et al. (2010), however, it is possible to use departmental heterogeneity to reinforce the identification of the model by adding as excluded instrument a proxy for the “departmental APA generosity” or average professional care by department.

The final issue concerns the large number of non-responses characterising the declaration of caregiving

⁹It would have been preferable to be more specific in defining sub-populations within which the matches were made by distinguishing, for instance among those not living with a partner, those living alone from those who co-reside with an adult child. However, the size of our sample requires us to limit the number of sub-populations used. Moreover, living with a partner may be assumed to be exogenous whereas co-residing with a child could be endogenous with regards to benefiting from the APA.

time, especially concerning informal care. In the sample, 31% of the individuals who report receiving informal care are characterised by a missing value for the number of informal care hours, which represents 20% of the entire sample. Moreover, 9% of those who report receiving formal care are also characterised by a missing value for the number of formal care hours, which represents 5% of the entire sample. In our analysis, the effect of the APA on the number of care hours received per week is estimated after exclusion of non-responses. This exclusion may affect our results, especially if the non-responses regarding caregiving time depend on unobserved characteristics.

6 Results

As previously mentioned, three outcomes related to both formal care and informal care are used to study how recourse to the APA affects the care received by elderly people who need assistance to perform ADLs or IADLs. First, we study the effect on care arrangement (i.e., the use of formal and informal care). Second, we study the effect of recourse to the APA on the intensity of formal care (resp. informal care) conditional on benefiting from formal care (resp. informal care). Finally, we evaluate how the use of the APA affects the range of care received.

For each care outcome, we report results for the overall population of APA recipients but also for 4 sub-populations, by distinguish slightly disabled APA recipients from highly disabled APA recipients and APA recipients who co-reside with a partner from those not co-residing with a partner. As already mentioned, previous literature highlights different interactions between informal care and formal care according to the disability level of elderly people (Bonsang, 2009). In particular, the substitution between informal care and formal care appears to be much larger for elderly people whose needs are low and who require unskilled types of care. We then distinguish the slightly dependent population, composed of individuals who report difficulties in performing at least one ADL or IADL but who also report that they are able to perform (potentially with difficulties) all of the ADLs without assistance and the highly disabled population, composed of individuals who report that they are unable to perform at least one ADL without assistance. We also distinguish APA recipients who co-reside with a partner from those who do not co-reside with a partner because the care arrangements and the substitution between informal care and formal care are likely to be very different in both cases.

6.1 Effect of recourse to the APA on formal care

The first step of our empirical analysis aims to evaluate the degree to which APA benefits affect formal care utilisation. For each outcome related to formal care, we then compare the observed outcome among APA

recipients with their estimated outcome if they did not benefit from the APA.

As expected, benefiting from the APA increases significantly the use of formal care. However, formal care utilisation remains high even when individuals do not resort to the APA. In particular, 6 out of 10 APA recipients would have used formal care without the APA. Figure B1 in Appendix B puts forward that the effect of benefiting from the APA on the formal care utilisation varies according to the disability level and the marital status of the elderly. In particular, the increase in formal care utilisation are weaker among highly disabled APA recipients not co-residing with a partner. In this case, 72% of APA recipients would use formal care even without benefiting from the APA. On the contrary, for slightly disabled APA recipients who co-reside with a partner, formal care utilisation would be remarkably less common if they did not benefit from the APA : only 34% of individuals would have used formal care without the APA.

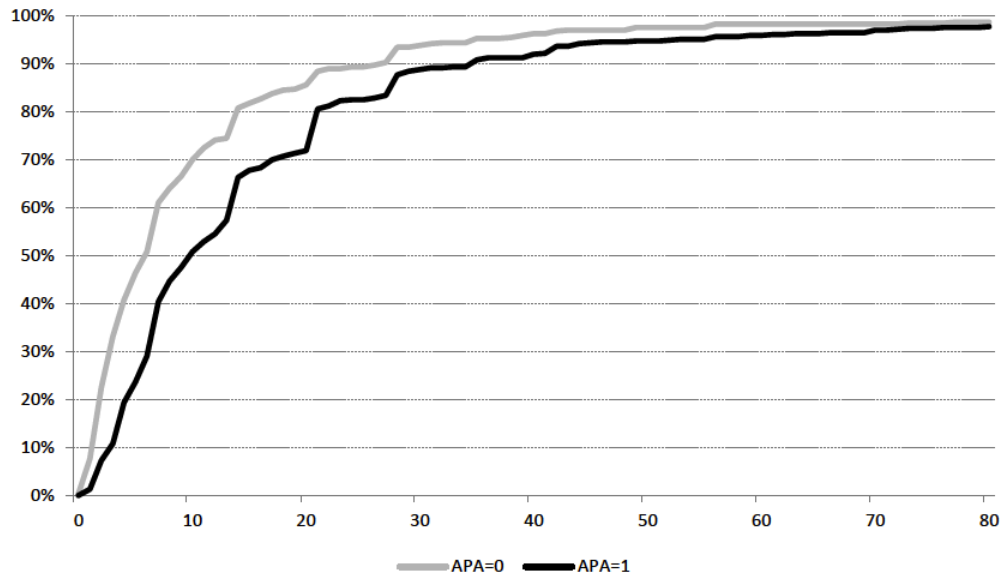
In addition to the increased probability of receiving professional care, recourse to the APA significantly increases the intensity of care received from professionals. An analysis in terms of stochastic dominance shows that, conditional on receiving professional care, the distribution of the number of hours per week with the APA dominates, at the first order, the distribution without the APA, for the overall population of APA recipients but also for each sub-population considered (Figure 3 and Figure B2 in Appendix B). To verify the significance of this first-order stochastic dominance, we use the test proposed by Anderson (1996). The dominance is always significant at the 1%¹⁰. Conditional on receiving formal care, benefiting from the APA is thus associated with a greater amount of formal care : the median number of care hours¹¹ provided by professionals increases by 4 hours per week on the overall sample (from 6 hours without the APA to 10 hours with the APA). The increase in formal caregiving time is however higher for highly disabled elderly : the median number of formal care hours increases by 2 hours per week among slightly disabled elderly (from 4 hours without the APA to 6 hours with the APA) and by 7 hours per week for highly disabled elderly people (from 7 hours without the APA to 14 hours with the APA). Furthermore, note that publicly funded professional caregiving time does not seem to be affected by the marital status of APA recipients¹². This independence suggests that the Care Plan defined by the social medical team does not depend on informal care resources.

¹⁰Let F_1 be the cumulative distribution of the outcome Y_k conditional on benefiting from the APA ("*Distribution 1*") and F_0 be the cumulative distribution of the outcome Y_k conditional on not benefiting from the APA ("*Distribution 0*"). Following Anderson (1996), the first-order dominance of "*Distribution 1*" over "*distribution 0*" requires that $F_1(y_k) - F_0(y_k)$ (i) is never significantly greater than 0 for each possible value of y_k and (ii) is significantly lower than 0 for at least one value of y_k . We then use standard two-sample proportion tests for testing : (i) $H_0 : F_1(y_k) - F_0(y_k) = 0$ against $H_a : F_1(y_k) - F_0(y_k) > 0$ and (ii) $H_0 : F_1(y_k) - F_0(y_k) = 0$ against $H_a : F_1(y_k) - F_0(y_k) < 0$ for each observed value y_k .

¹¹As central tendency, we prefer consider median caregiving time which is more robust to extreme values than the average caregiving time. Some individuals indeed report receiving 24 hours of assistance per day from one caregiver. Although these extreme values reveal the necessity of being constantly available to meet the needs of disabled elderly people, these values may not be considered as a reflection of real "care production" because, at a minimum, the caregiver must devote a certain amount of time to sleep.

¹²Whether or not they co-reside with a partner, highly disabled APA recipients receive a median professional caregiving time equal to 14 hours. This equality also characterises the slightly disabled APA recipients who receive a median professional caregiving time equal to 6 hours when they co-reside with a partner or not.

Figure 3. Cumulative distributions of formal care hours per week among those who use formal care



We finally investigate how the use of the APA affects the range of formal care received. This characteristic of care is studied through the number of care activities in which formal caregivers are involved. The HSM questionnaire allows us to distinguish 8 care activities : 1) personal care (bathing, dressing, meals) ; 2) household chores (cleaning, making meals) ; 3) managing the budget and completing paperwork and administrative processes ; 4) ensuring a presence or providing companionship ; 5) monitoring the actions of the elderly person ; 6) taking the elderly person to the doctor and taking care of his/her health problems ; 7) shopping and buying medicine ; and 8) Other activity. Increasing professional involvement induced by recourse to the APA is also observed with regard to this criterion (Figure 4). On the overall sample, the average number of care activities involving professional caregivers increases significantly from 2 to 2.5. Regardless of the disability level and marital status of the APA recipients, we observe a significant dominance of the distribution with the APA over the distribution without the APA (Figure B3 in Appendix B) with an average increase similar for each sub-population. Among the APA recipients, the average number of care activities involving professional caregivers is however higher among the highly disabled population and lower among those who co-reside with a partner. Therefore, those who co-reside with a partner receive the same amount of publicly funded formal care (with regards to the number of hours) than those who do not co-reside with a partner but formal care is in their case more concentrated on certain activities.

Figure 5 and Figure B4 in Appendix B report the activities in which professional caregivers are involved. The use of the APA leads to a significant increase of professional caregivers' involvement in all activities (except the category 8) other). However, professional caregivers's involvement are mainly focused in household chores and personal care, especially for individuals not co-residing with a partner.

Figure 4. Cumulative distribution of the number of care activities involving professional caregivers, among those who use formal care

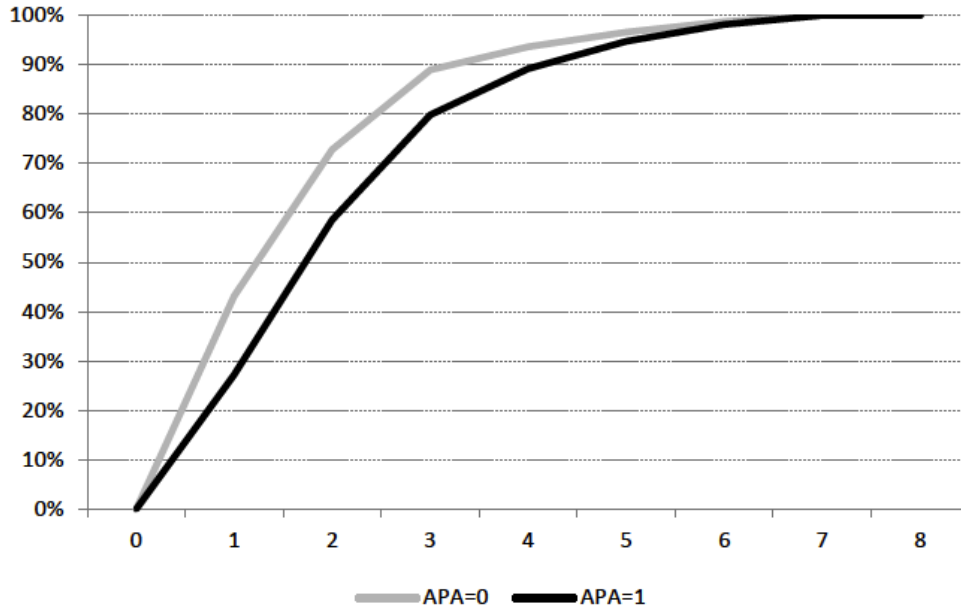
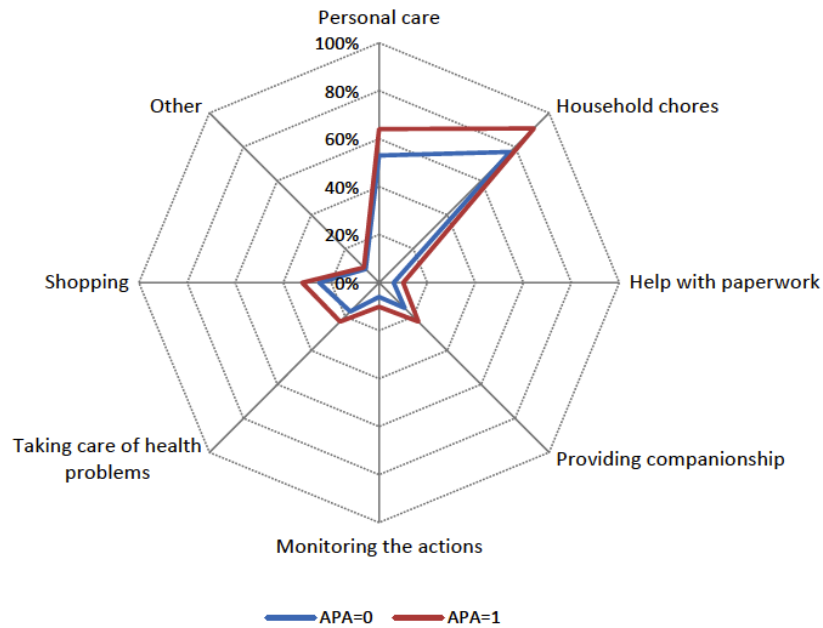


Figure 5. Proportion of APA recipients receiving formal care, by care activity, among those who use formal care



6.2 Effect of recourse to the APA on informal care

Turning now to the effect of benefiting from the APA on the probability to receive informal care, we observe, in addition to the significant increase in formal care utilisation, a significant decrease in informal care utilisation. While 76% of APA recipients receive informal care, they would be 69% in this case without benefiting from the APA. However, the increase in formal care utilisation is only partially offset by the decreased involvement of informal caregivers. The relative decline in informal care utilisation (-9%) is indeed seven times lower than the relative increase in formal care utilisation (+64%).

The change in care arrangement appears however different according to the disability level and marital status of APA recipients (Figure B5 in Appendix B). The increase in formal care utilisation and the decline in informal care utilisation associated with recourse to the APA are higher among slightly disabled elderly and those who live with a partner. From this point of view, two patterns emerge. Among highly disabled APA recipients living alone, formal care utilisation remains high even when these individuals do not resort to the APA. Thus, the related decrease in informal care utilisation is rather limited; the 3-pp decrease we estimate is not significant at the 10% level. On the contrary, among slightly disabled APA recipients co-residing with a partner, formal care utilisation would be remarkably less common if they did not benefit from the APA. Nevertheless, the decision to have recourse to the APA would be for this population associated with a 20-pp decrease in the probability of receiving informal care (p-value=1%). From this point of view, the adjustment of informal care is primarily the result of APA recipients' partner; the decline in the probability of receiving care from others relatives is not significant.

The clear decline in informal care provided by partner to slightly disabled APA recipients must be nuanced. The decrease is indeed significant only for the less disabled sub-population, identified as the population of individuals who report less than 6 difficulties in performing ADLs or IADLs¹³. Among these individuals, recourse to the APA induces a 28-pp decrease (p-value<1%) in the probability of receiving informal care (decreasing from 86% without APA to 58% with APA), whereas the 9-pp decrease observed among those who report at least 7 difficulties in performing ADLs or IADLs is not significant (p-value=19%). The substitution we observe between the informal care provided by partner and publicly funded formal care is then concentrated within the less disabled population (i.e., a population whose needs may require only limited care provision). Similarly, the 8-pp significant decrease in informal care utilisation we observe among slightly disabled elderly not co-residing with a partner is concentrated on the less disabled sub-population¹⁴.

The main results related to changes in care arrangements associated with recourse to the APA may be summarised as follows. Overall, the recourse to the APA increases formal care utilisation and tends to

¹³We chose 6 as the threshold because it represents the median number of difficulties in performing ADLs and IADLs as reported by the individuals surveyed.

¹⁴Among those who report less than 6 difficulties in performing ADLs or IADLs, we observe a 15-pp decrease in informal care utilisation, whereas we observe a strict stability among those who report at least 7 difficulties in performing ADLs or IADLs.

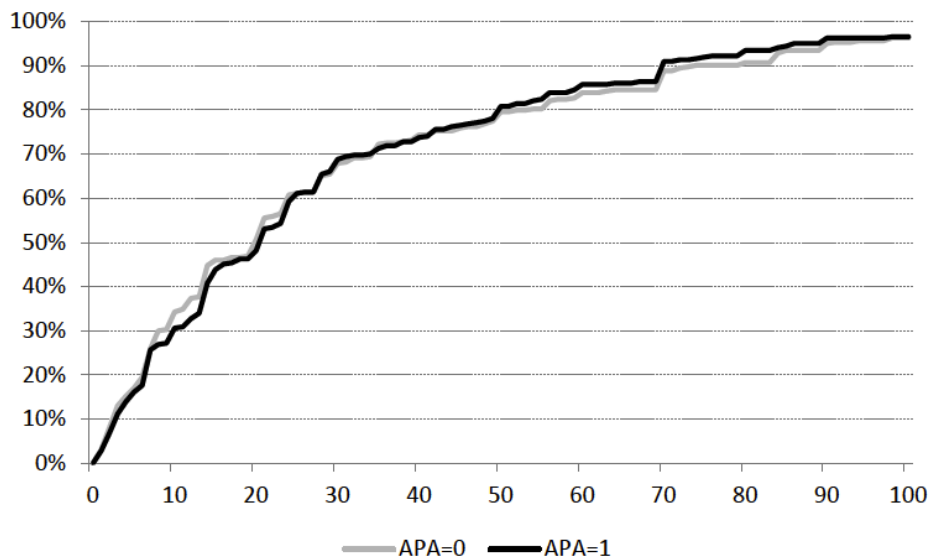
reduce informal care utilisation. However, the magnitude of these changes is highly dependent on the elderly individuals' needs and the presence of a partner as alternatives to professional caregivers. From this point of view, two extreme cases can be distinguished. First, the effect of recourse to the APA appears to be relatively modest for highly disabled elderly people not co-residing with a partner. The use of APA leads to a limited increase in formal care utilisation, which remains, with or without the APA, an important form of care. The effect on informal care utilisation is not significant in this case. For slightly disabled elderly people living with a partner, the changes in care arrangements are much greater. For these individuals, recourse to the APA leads to a clear increase in the probability of receiving formal care, which would be used considerably less without the public allowance, and a significant decline in partners' involvement in care. When the needs of elderly people are reduced or limited to a specific activity, disabled elderly's partner thus appear as credible alternatives to the use of professional services.

With regards to the intensity of informal care, conditionally on receiving informal care, we observe a strong stability of informal caregiving time (Figure 6). The distribution of informal caregiving time with the APA do not significantly differ from the distribution of informal caregiving time without the APA. The median informal caregiving time received is equal to 20 hours per week and is the same regardless of whether they benefit from the APA. When we distinguish APA recipients according to their disability level and marital status, conclusion are similar, except among slightly disabled elderly co-residing with a partner, for whom the median informal caregiving time decreases significantly from 21 to 15 hours per week¹⁵ (Figure B6 in Appendix B). Therefore, in this case, informal caregivers would partially offset the non-use of the APA by an increased level of involvement.

In summary, recourse to the APA is associated with a significant increase in the amount of professional care among those who would use professional care even without the public allowance. The increase is observed regardless of the disability level and martial status of the APA recipients. However, the higher intensity of care provided by professional caregivers is not associated with a significant decline in the amount of care provided by informal caregivers, except among slightly disabled elderly people living with a partner. In this case, informal caregivers (presumably APA recipients' partner), represent a major care resource that may partially substitute for the care provided by professional services.

¹⁵ Among highly disabled elderly co-residing with a partner, the two distributions are significantly different. We cannot however conclude to the dominance (at the first-order) of one distribution over the other.

Figure 6. Cumulative distributions of informal care hours per week among those who receive informal care



The stability we observe with regards to informal caregiving time is also observed when we consider the number of care activities involving informal caregivers (Figure 7). We observe a stochastic dominance of the distribution without APA over the distribution with APA, but the dominance is not significant. Regardless individuals benefit from the APA, the number of care activities in which informal caregivers are involved appears considerably higher than the number of care activities involving professional caregivers : informal caregivers are on average involved in 5.1 activities without APA and 5.0 with APA. Moreover, while we observe a significant decrease in informal caregivers’ involvement in household chores and personal care, involvement in others activities remains very stable (Figure 8).

Figure B7 and B8 in Appendix B reports results for each sub-population. When we restrict the analysis to APA recipients co-residing with a partner, we observe a significant decrease in the number of activities involving informal caregivers. For both slightly disabled and highly disabled elderly, the distribution without APA dominates significantly the distribution with APA. Among APA recipients not co-residing with a partner, we do not observe such decrease even if we observe a modification in the care activities involving informal caregivers. In particular, the decrease in informal caregivers’ involvement in personal care or household chores is partially compensated by an increasing involvement in activities such as providing companionship, monitoring the action of the APA recipients or help with paperwork.

Figure 7. Cumulative distribution of the number of care activities involving informal caregivers, among those who receive informal care

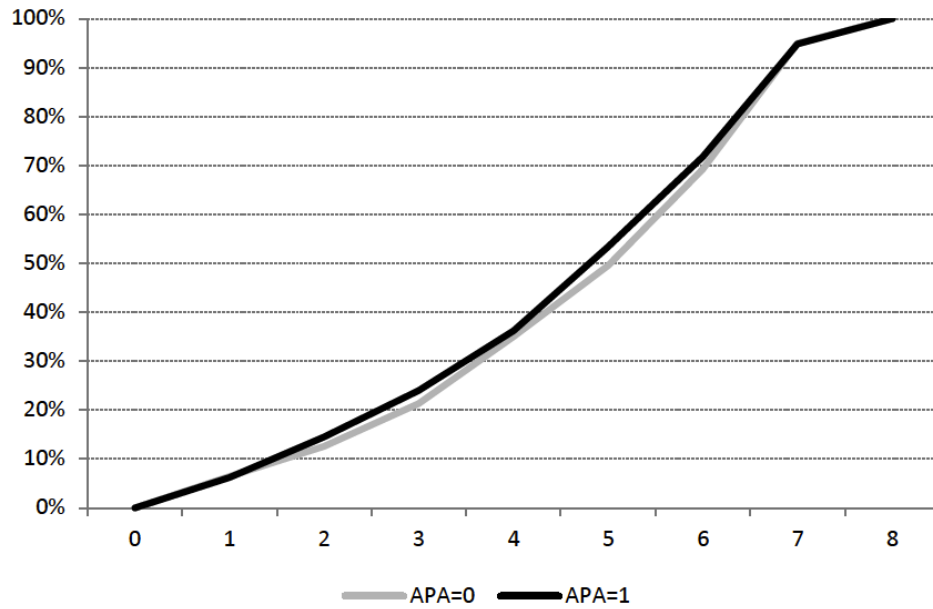
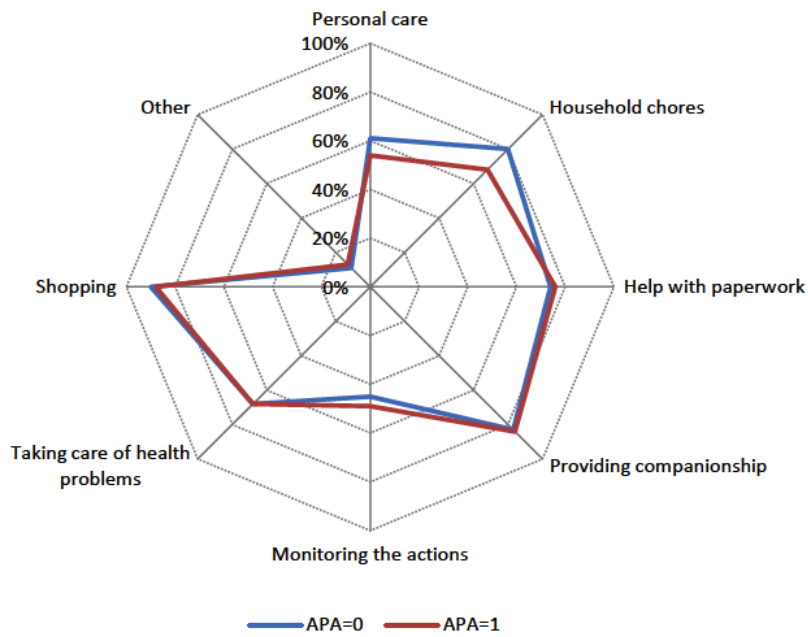


Figure 8. Proportion of APA recipients receiving informal care, by care activity, among those who receive informal care



7 Conclusion

This paper aims to address the question of whether public support for the use of professional home care leads to a decline in family support. The potential crowding out effect is investigated in the French context to assess how the receipt of the APA changes the care received by disabled elderly.

We outline a comparison of the APA recipient population from the APA non-recipient population with respect to the care they received. We control observed heterogeneity between the two sub-populations by using the matched sampling method proposed by Rosembaum and Rubin (1985). Our comparison is based on the critical conditional independence assumption. A previous study from Rapp *et al.* (2011) provides evidence that the use of the APA is exogenous with regard to the provision of informal care, suggesting that our results are not driven by the presence of unobserved heterogeneity. However, further research are needed to validate this crucial assumption in our sample.

Nevertheless, the comparison of both populations suggests that the use of publicly funded formal care does not result in a massive withdrawal of family despite a significant decrease in family support in some specific situations. This finding is consistent with previous literature in France but also in each country where this question has been addressed.

Specifically, we found that the degree of substitution between public and family support depends on elderly's family configuration and disability level. From this point of view, the involvement of disabled elderly's partner appears to be strongly associated with the use of publicly funded formal care. This is particularly true when the elderly needs are low, meaning that they potentially can be supported solely by informal care or solely by formal care. In this case, benefiting from the APA leads to a decrease in the probability of receiving informal care but also, conditional on receiving informal care, to a significant decrease in the intensity and range of informal care. Therefore, informal care from disabled elderly's partner appears as a clear alternative to the use of formal care, at least for slightly disabled elderly.

The substitution is much lower for disabled elderly people who cannot count on care from a partner. In this situation, the formal care demand appears rather inelastic with regard to the price of professional care because most of them already use home care workers without benefiting from the APA. In particular for highly disabled elderly, the necessity to meet the important needs seems to influence the choice of the care resource more than the price of professional services. Thus, conversely to care from partner, care from children and other relatives does not seem represent a substitute for the use of publicly funded formal care.

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Appendix A : Descriptive statistics

Table A1. Descriptive Statistics

	n=4256		
	Without APA (n=3487)	With APA (n=769)	All (n=4256)
Receive IC	63%	69%	64%
Receive FC	42%	100%	52%
Gender			
Woman	67%	73%	68%
Man	33%	27%	32%
Age (average)	76	81	77
Household configuration			
Living alone	38%	46%	40%
Living with a partner	43%	33%	42%
Living with a child	9%	14%	10%
Living with a partner and a child	6%	3%	6%
Living with other	3%	3%	3%
Number of daughters (average)	1.4	1.3	1.4
Number of sons (average)	1.3	1.4	1.3
Standard of Living (average, in €)	1271	1174	1253
Rural area			
No	78%	68%	76%
Yes	22%	32%	24%
Department			
Overseas departements	14%	9%	13%
Others	86%	91%	87%
KATZ index			
A	85%	45%	78%
B or C	9%	25%	12%
D or E	2%	9%	3%
F or G	3%	17%	5%
H	2%	4%	2%
ADLs (reporting difficulties in performing)			
Bathing	29%	73%	37%
Dressing and undressing	26%	61%	32%
Cutting food and pouring a drink	14%	41%	19%
Eating and drinking on the food is ready	3%	14%	5%
Toileting	8%	31%	12%
Lying down in or getting out of the bed	13%	41%	18%
Sitting down in or getting up from the chair	12%	34%	16%
IADLs (reporting difficulties in performing)			
Shopping	63%	89%	67%
Preparing meals	30%	71%	37%
Doing common household chores	53%	90%	60%

continued...

Table A1. Descriptive statistics (continued)

	n=4256		
	Without APA (n=3487)	With APA (n=769)	All (n=4256)
Doing less common chores	68%	91%	73%
Doing administrative works	50%	80%	55%
Taking medications	16%	46%	22%
Moving around in all of the rooms on a floor	9%	31%	13%
Leaving your home	27%	61%	33%
Using a method of transportation	39%	72%	45%
Finding its way	15%	42%	20%
Using a telephone	10%	31%	14%
Using a computer	18%	27%	20%
Self-reported health status			
"Bad" or "very bad"	40%	62%	44%
"Pretty good"	49%	34%	47%
"Good" or "Very good"	10%	3%	9%
Alzheimer disease			
No	94%	78%	91%
Yes	6%	22%	9%

Appendix B : Results by sub-populations

Figure B1. Proportion of APA recipients receiving formal care

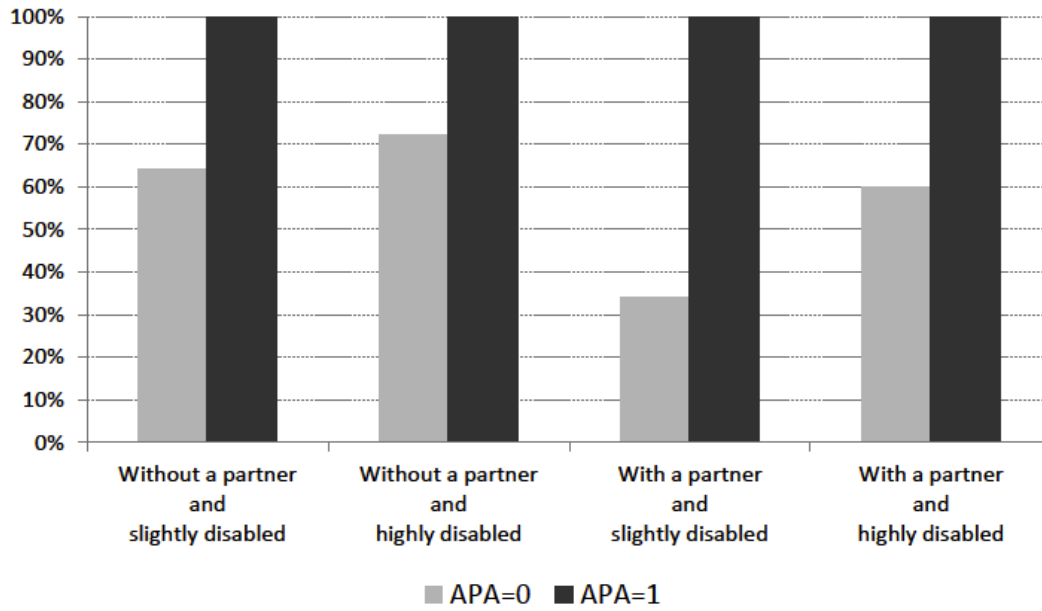


Figure B2. Cumulative distributions of formal care hours per week among those who use formal care

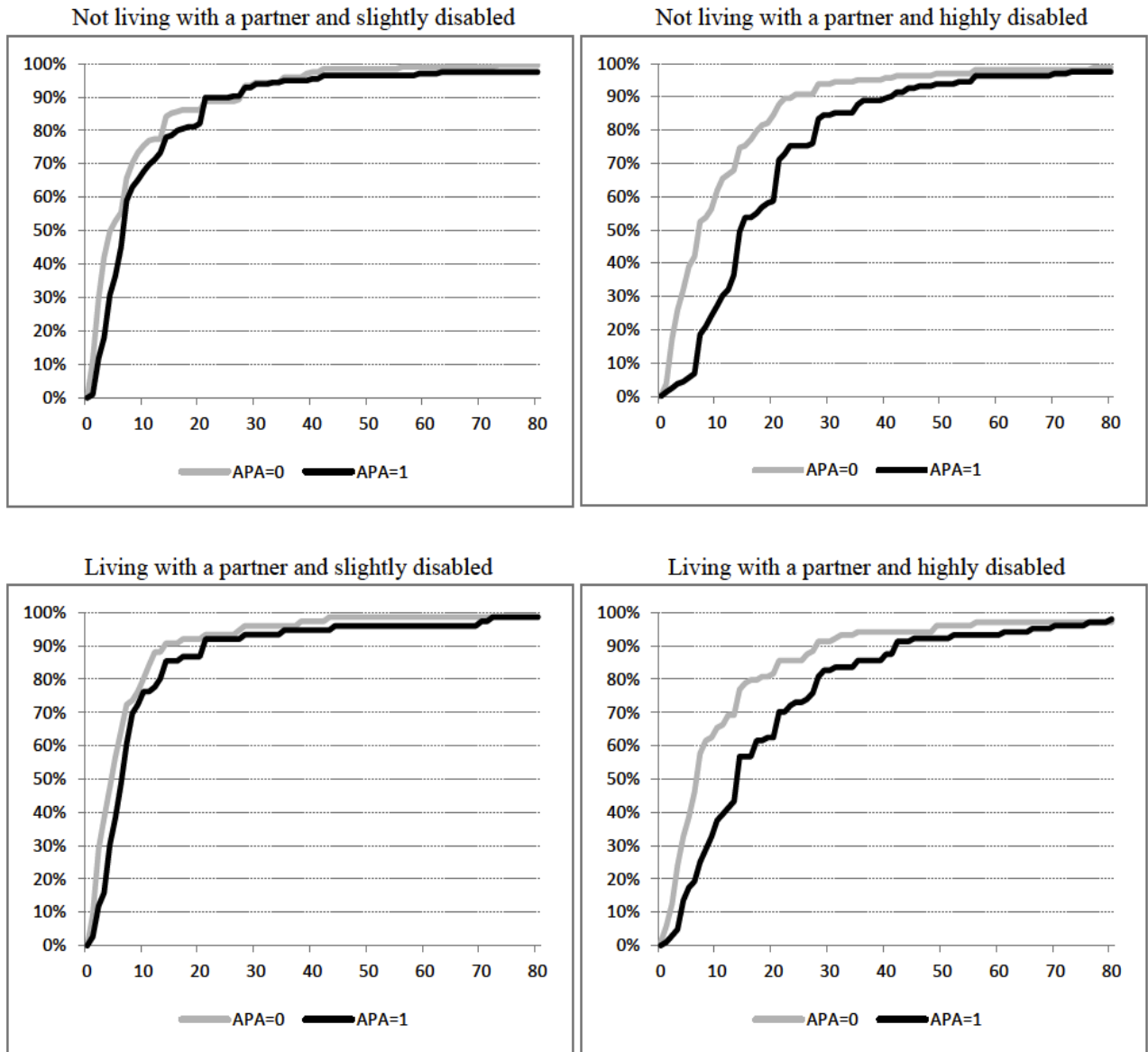


Figure B3. Cumulative distribution of the number of care activities involving professional caregivers, among those who use formal care

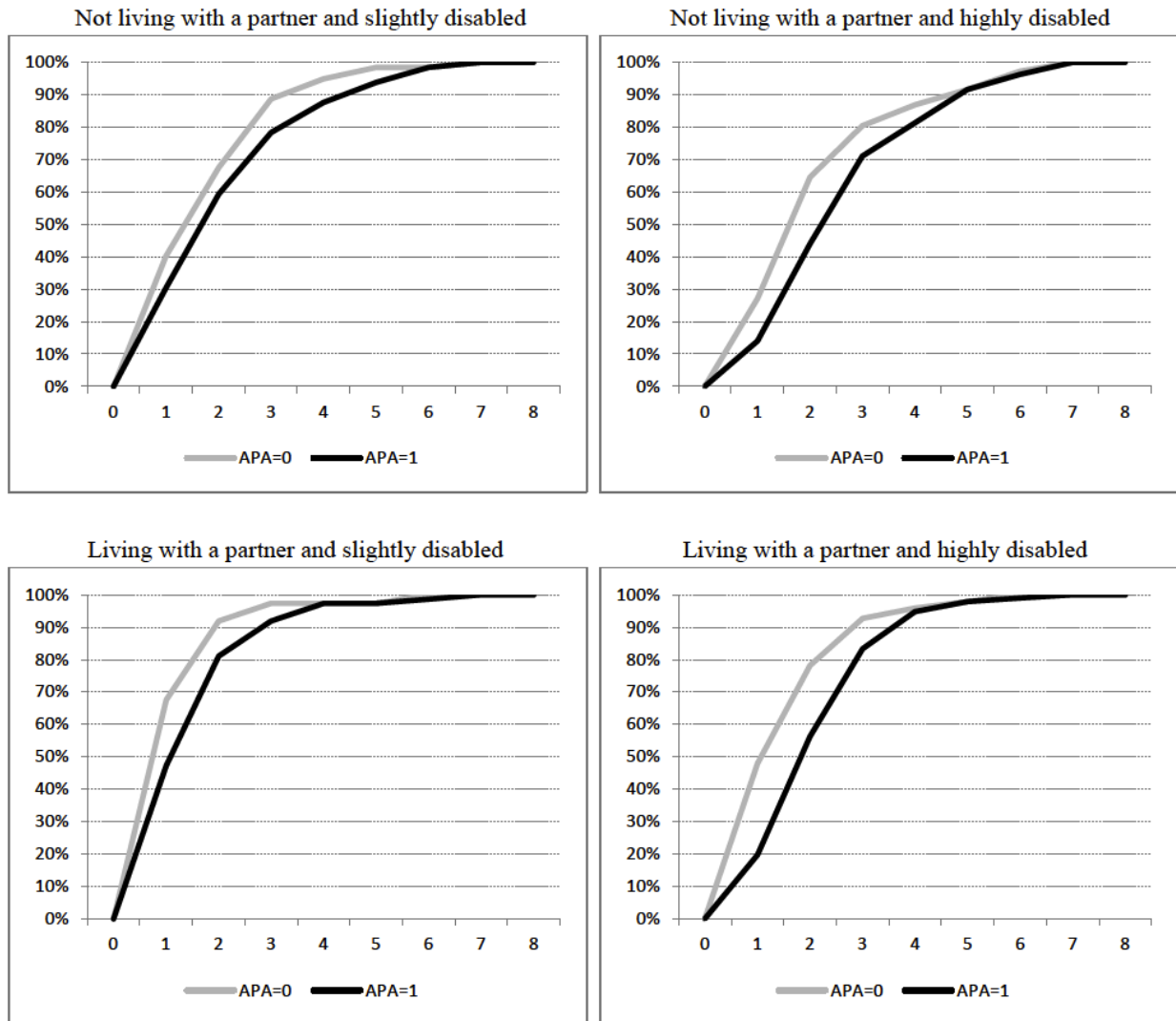


Figure B4. Proportion of APA recipients receiving formal care, by care activity, among those who use formal care

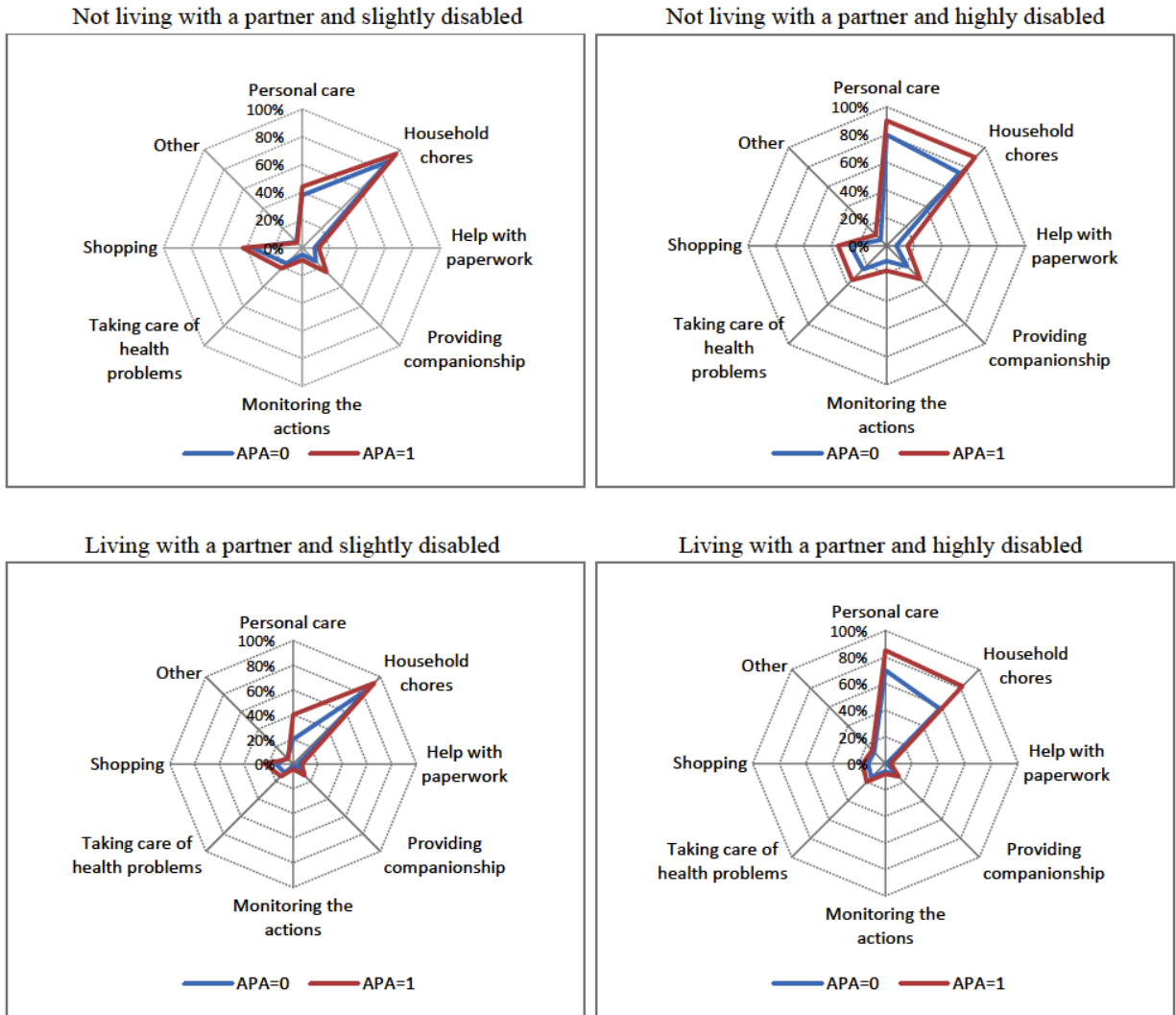


Figure B5. Proportion of APA recipients receiving informal care

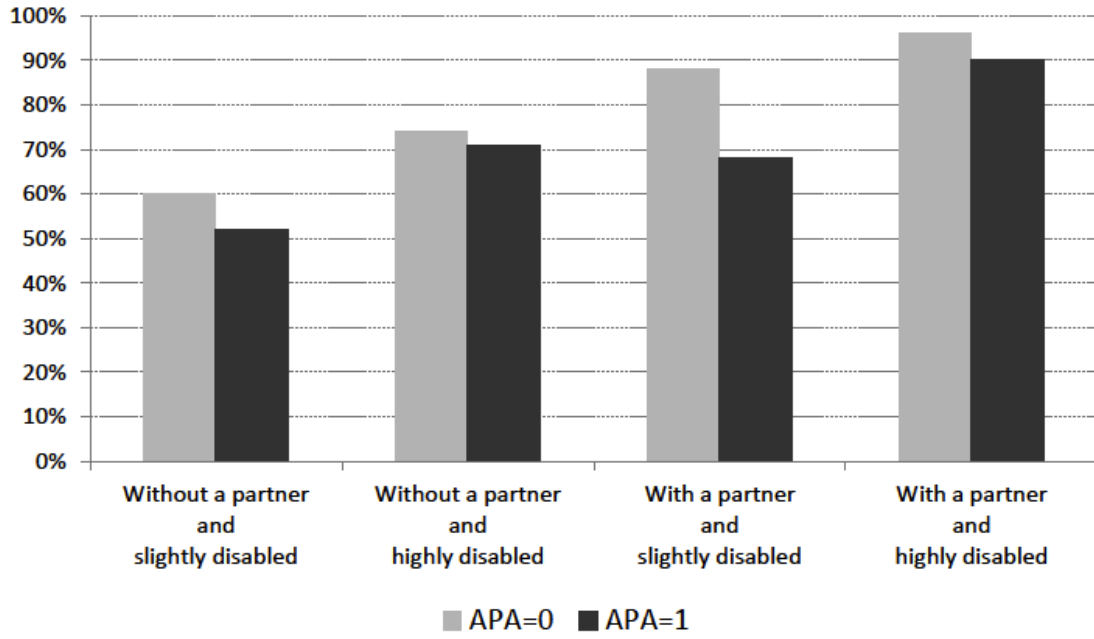


Figure B6. Cumulative distributions of informal care hours per week among those who receive informal care

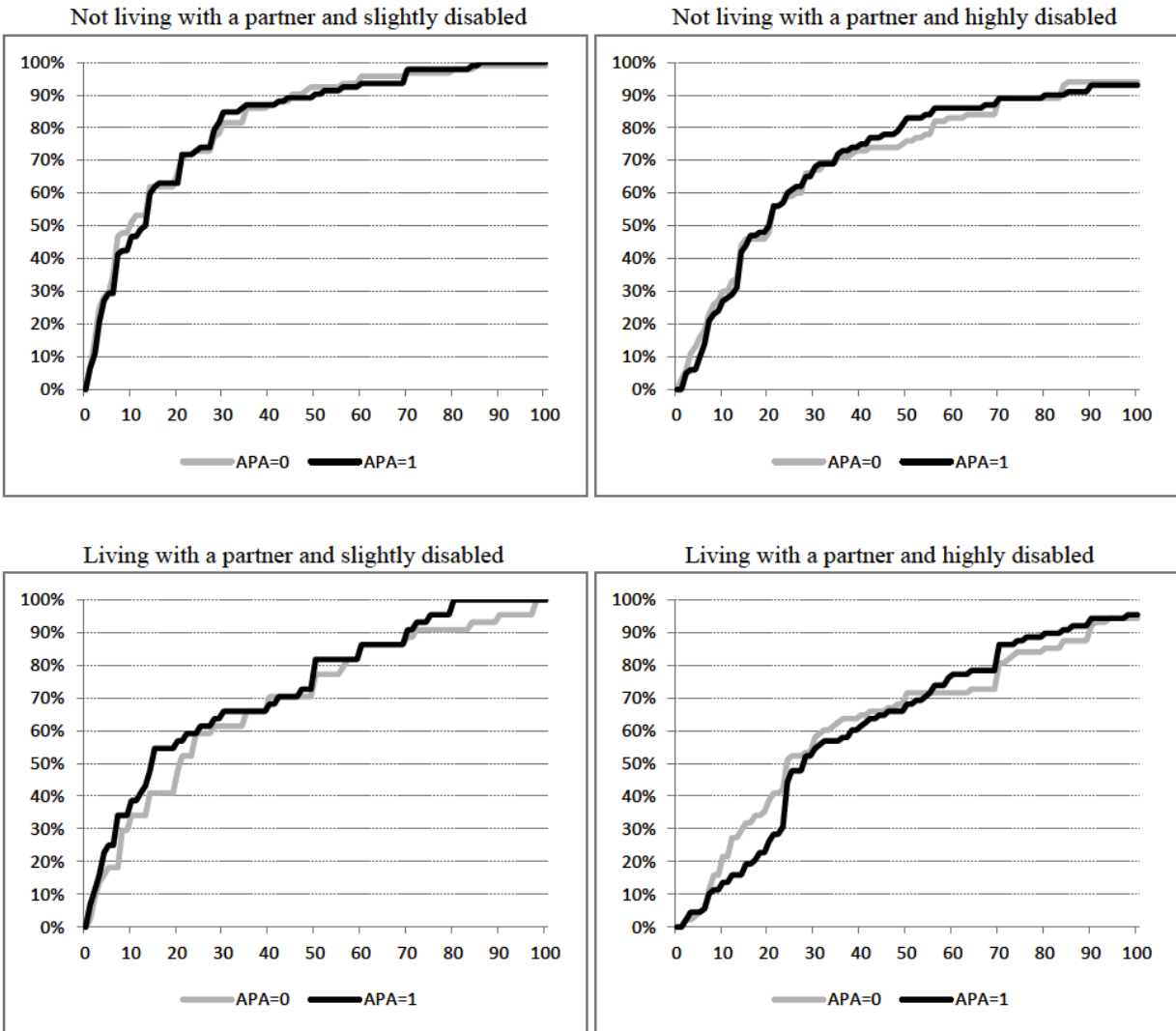


Figure B7. Cumulative distribution of the number of care activities involving informal caregivers, among those who receive informal care

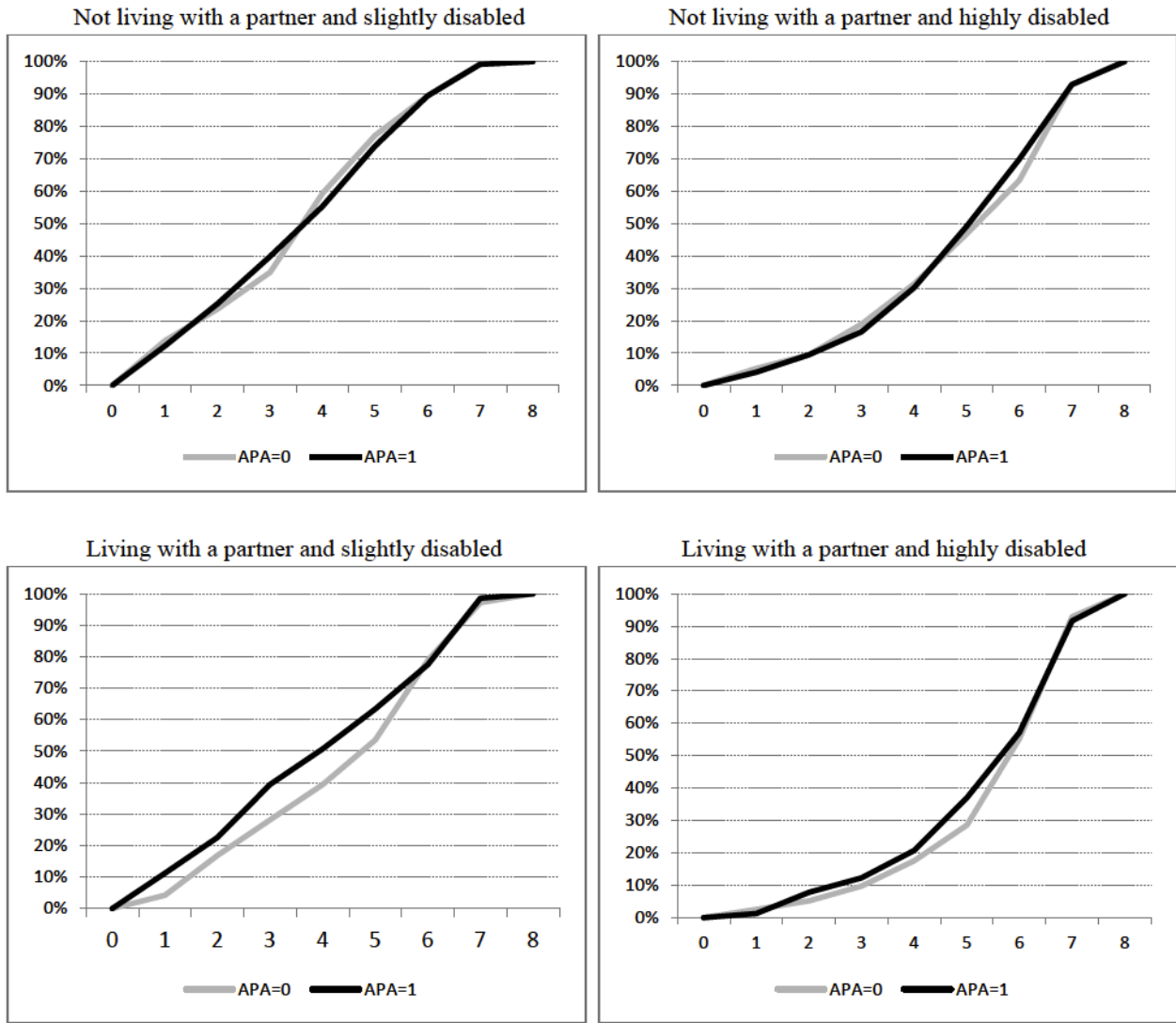


Figure B8. Proportion of APA recipients receiving informal care, by care activity, among those who use informal care

