How do the elderly die in very fast ageing territories? The case of the French overseas departments.

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Short Abstract

Objectives:

The aim of the study was to describe the circumstances of death in nonagenarians, and to compare them with the rest of the population in these territories, particularly with regard to the characteristics of the patients and the clinicians caring for them.

Methods:

A retrospective study of a random sample of adult patients who died March 2020 and February 2021 was conducted in overseas France. Physicians who certified the deaths were asked to describe end-of-life care and medical decisions in a questionnaire.

Results:

A total of 1815 deaths were analysed with a total of 1407 questionnaires collecting data on informed deaths. The nonagenarians were mostly women with cognitive disorders and died at home Physicians were mostly general practitioners with many years of practice. Nonagenarians received less palliative care than the rest of the population. There is a lower use of deep and continuous sedation maintained until death and more situations with no decisions taken

Conclusions:

The population of nonagenarians is quite specific in terms of causes of death and comorbidities. It seems essential to improve end-of-life care for these patients, particularly in terms of access to palliative care and management of discomfort symptoms.

Extended Abstract

INTRODUCTION

An ageing global population with specific care needs

The elderly population is growing steadily, and rapidly. Worldwide, the number of people over the age of 60 was one billion in 2019, and is expected to double by 2050

This population has a number of specific characteristics, including unreliable prognostic factors, particularly for non-malignant diseases (8). The difficulty is reflected in the short time between the cessation of supportive treatment and the initiation of palliative care, followed by death (9) This is a reminder of the importance of advance care planning for the elderly population in order to respect their end-of-life wishes (10).

We know the reasons of death and places of death, thanks to death certificates, but no data is available on the circumstances of death in this population. We need more information on the end-of-life conditions of these very old patients.

The overseas France is marked by a negative migratory balance (11), leading to a more rapid ageing of the population. The population of nonagenarians will multiply by 4 between 2020 and 2070 (12). Generational cohabitation is higher than in the mainland (14), in the face of a very limited number of institutionnalisation places with a predominance of deaths at home than in institutions (15). We can nevertheless use this area as an example to study this specific population, because they share the same administrative framework and legal rules, despites disparities exist. Palliative care provision in FOD is lower than in metropole territories (16).

The aim of the study was to describe the circumstances of death in nonagenarians living in the overseas France, and to compare them with the rest of the population in these territories, particularly with regard to the characteristics of the patients and the clinicians caring for them.

METHODS

Study design and study population

The protocol is published in a repository (17). This study was a survey of physicians held between September 2020 and July 2022 about descendants of whom they had signed the medical certificate of death from March 2020 to February 2021. Physicians were surveyed over one year on a sample of patients who had died from any cause and at any location. Physicians were identified by extracting their details from death certificates and were sent the survey as a paper self-questionnaire.

Questionnaire and variables

The questionnaire (17) covered place of care and medical decisions at the end of life and social context including religion and family environment .

Deaths were classified as either informed if physicians could report on end-of-life care, or uninformed, mostly when physicians had known the patient for a short or no time. Physicians could further classify deaths as sudden or non-sudden. In this study, informed deaths were analysed in the first part but medical decisions are only on informed non sudden deaths.

We identified the following variables of interest:

- concerning the deceased: sex, cognitive disorders, urban/rural place of residence, place of death, main causes of death, wish for place of death, presence of a designated healthcare representative, presence of advance healthcare directives, initiation of palliative care.
- concerning the certifying physician: sex, age, speciality of practice, place of practice and training in palliative care.
- concerning the medical decisions: We used several questions to determine the main end-of-life decisions : every to prolong life, decisions without taking into account it might hasten death withholding treatment, withdrawing treatment, deep and continuous sedation until death, intensification of pain relief, putting deliberately end the life, no type of decisions, (20)
- concerning treatments during last week before the death, we categorised them as follows: for curative purpose only,for palliative purpose only, for curative and palliative purpose and no treatment. - We also examined places of care in the last two months and the number of transitions from these places. To do this, we segmented the period into 4 phases: D-60 before death, D-30, D-7 and D-0. We categorised

three groups: no transitions, one transition, and at least two transitions. A transition is defined as a change in the place of care between two phases.

Statistical analysis

The data set was weighted and standardised using a bounded logit calibration by sex, age, place of death, period of data collection and French overseas departments to account for territorial disparity in response rate and to ensure representativeness of 2020 deaths in these territories..

Categorical data were described using n weighted and weighted percentages.

The comparison of proportions for variables will be performed using a Chi2 test. Statistical significance was defined as a 2-sided at the 5% significance level.. some multivariate analysis (binomial and multinomial logistic analyses were performed

PRELIMINARY RESULTS

Study population

12 895 deaths occurred in the inclusion period, and 8730 were investigated. A total of 1815 questionnaires were returned by certifying physicians The overall response rate is 22.9%, with a total of 1407 questionnaires collecting data on informed deaths. Among them, 1082 (n weighted = 1029.29) were non sudden informed deaths with a number of 229 (n weighted = 245.07) nonagenarians and over.

Decedents' characteristics for nonagenarians

For nonagenarians and over, compared to the rest of the population, decedents were mostly female (63.1%; p<0.0001), with cognitive disorders (mild disorder with 29.99 % (p<0.0001) and severe disorder at 36.49% (p<0.0001)). Main cause of death was cardiovascular disease (36.59%; p<0.0001) followed by neurological or cerebrovascular disease (16.09%; p<0.0001) and cancer (15.4%; p<0.0001). Nonagenarians received less palliative care than the rest of the population (64.36% vs 74.83%; p=0.006). Nonagenarians lived mostly in rural communes (55.45%; p=0.0027) and mostly died at home (58.85%; p<0.0001). Nonagenarians were less likely to complete advance directives (0.78%; p=0.0237) and appoint a designated healthcare representative (38.78% ; p=0.0182). Nonagenarians more frequently expressed their wishes regarding their preferred place of death (33.71% vs 20.35%; p<0.0001). No significant difference was found for conditions with patient expectation in line (59.17% vs 50.78%; p=0.1292).

Table 1a: Characteristics of decedent patients

Variables	weighted N		weighted column %		X^2	p-value
	Under 90 years old	90 years old and over	Under 90 years old	90 years old and over		
All	784.22	245.07				
Sex of decedent					29.75	<0.0001
Male	439.94	90.42	56.10	36.90		
Female	340.18	154.65	43.38	63.10		
Missing values	4.10	0.00	0.52	0.00		
Cognitive disorder					28.38	<0.0001
None	362.34	69.41	46.20	28.32		
Mild disorder	144.32	73.50	18.40	29.99		
Severe disorder	248.10	89.42	31.64	36.49		
Unknown	25.21	11.04	3.22	4.51		
Missing values	4.25	1.70	0.54	0.69		
Main cause of death					102.35	<0.0001
Cardiovascular disease	101.88	89.67	12.99	36.59		
Cancer	311.41	37.75	39.71	15.40		
Neurological or cerebrovascular disease	142.90	39.43	18.22	16.09		
infectious disease	103.97	27.84	13.26	11.36		
Respiratory system disease	45.30	13.92	5.78	5.68		
Digestive system disease	26.45	5.39	3.37	2.20		
Mental or psychiatric disorder	20.75	8.06	2.65	3.29		
Violent death, other causes	23.55	13.91	3.00	5.68		
Missing values	8.01	9.10	1.02	3.71		
Patient has received palliative care					12.46	0.006
No	190.33	86.71	24.27	35.38		
Yes	586.80	157.73	74.83	64.36		
Unknown	6.46	0.63	0.82	0.26		
Missing values	0.63	0.00	0.08	0.00		
Patient has chosen a nominated person					11.89	0.0182
No	209.91	80.44	26.77	32.82		
Yes	354.59	95.03	45.22	38.78		
Incapacity to nominate	97.71	20.31	12.46	8.29		
unknown	116.65	49.29	14.87	20.11		
Missing values	5.36	0.00	0.68	0.00		
Patient has written advance directives					9.46	0.0237
No	627.52	198.64	80.01	81.05		
Yes	23.04	1.92	2.94	0.78		
Unknown	112.68	30.31	14.37	12.37		
Missing values	20.98	14.20	2.68	5.80		
Conditions in line with patient expectation					5.66	0.1292
No	50.90	10.75	6.49	4.39		
Yes	398.24	145.01	50.78	59.17		
Unknown	315.53	84.25	40.24	34.38		
Missing Values	19.55	5.06	2.49	2.06		

Place of residence					14.19	0.0027
Urban area	382.91	99.44	48.83	40.58		
rural commune	355.03	135.90	45.27	55.45		
Unknown	35.38	3.00	4.51	1.22		
Missing values	10.90	6.73	1.39	2.75		
Patient has nominated a preferred place of death					22.65	<0.0001
No	375.64	112.57	47.90	45.93		
Yes	159.59	82.61	20.35	33.71		
Unknown	248.99	49.89	31.75	20.36		
Place of death					53.2	<0.0001
At home	294.44	144.23	37.54	58.85		
Hospital or private clinic	429.99	73.01	54.83	29.79		
Retirement, convalescent home, care home, geriatric unit	38.86	24.36	4.96	9.94		
Other	15.00	1.63	1.91	0.67		
Missing value	5.93	1.84	0.76	0.75		

Physicians' characteristics

Physicians were mostly female in both groups (57.84% vs 54.82%; p=0.3648), mostly general practitioners for nonagenarians (75.10% vs 55.00% ; p<0.0001) and aged 60 years old and over (28.03% vs 18.02% ; p=0.0022).

Training in palliative care was mostly absent (59.15% vs 55.77%) without significant difference between both groups (p=0.4614).

Table 1b: Characteristics of responding physicians

	weighted n		weighted column %		X^2	p-value
	Under 90 yrs	90 yrs and over	Under 90 yrs	90 yrs and over		
All	784.22	245.07				
Sex of physician					2.0169	0.3648
Male	348.91	99.88	44.49	40.75		
Female	429.88	141.74	54.82	57.84		
Missing value	5.43	3.45	0.69	1.41		
Age of physician					16.69	0.0022
Under 40 yrs	302.47	65.93	38.57	26.90		
40 and 49 yrs	161.47	49.36	20.59	20.14		
50 and 59 yrs	173.34	59.49	22.10	24.28		
60 yrs and over	141.32	68.70	18.02	28.03		
missing value	5.62	1.59	0.72	0.65		

Medical speciality					31.39	<0.0001
General practitioner	431.34	184.04	55.00	75.10		
Other speciality	338.28	58.18	43.14	23.74		
Missing values	14.60	2.85	1.86	1.16		
Place of practice					64.17	<0.0001
Independent practice	245.33	129.23	31.28	52.73		
Hospital structure	505.02	90.39	64.40	36.88		
Mixed structure	1.61	3.43	0.21	1.40		
Independent and hospital	7.41	2.20	0.94	0.90		
Hospital at home	19.36	16.53	2.47	6.75		
Unknown	5.49	3.29	0.70	1.34		
Training in palliative care					2.58	0.4614
No	437.36	144.96	55.77	59.15		
Yes, graduate training	199.60	52.76	25.45	21.53		
Yes, in-post-graduate training	136.33	45.76	17.38	18.67		
Missing values	10.93	1.59	1.40	0.65		

End-of-life medical decisions in FOD

Treatments were mostly withheld, especially for the nonagenarians (16.96%). Treatments withdrawn were similar in both groups (4.02% vs 3.58%). Intensification of treatment to alleviate symptoms was mostly done for patients under 90 years old (23.45 % vs 32.56%). Deep and continuous sedation until death was mostly absent for nonagenarians and over (2.84% vs 15.19). Decisions concerning the use of drugs to deliberate end of life, to prolong life and decisions without any consideration regarding death were similar in both groups. None of the investigated decisions was more present in the nonagenarians and over (30.59% vs 13.64%).

As presented in table 2, treatments during the last week before death were mostly for palliative purposes only in both groups (49.84% and 45.40%). Administration of non treatments during last week before death was very low in both groups (3.68% and 3.42%).

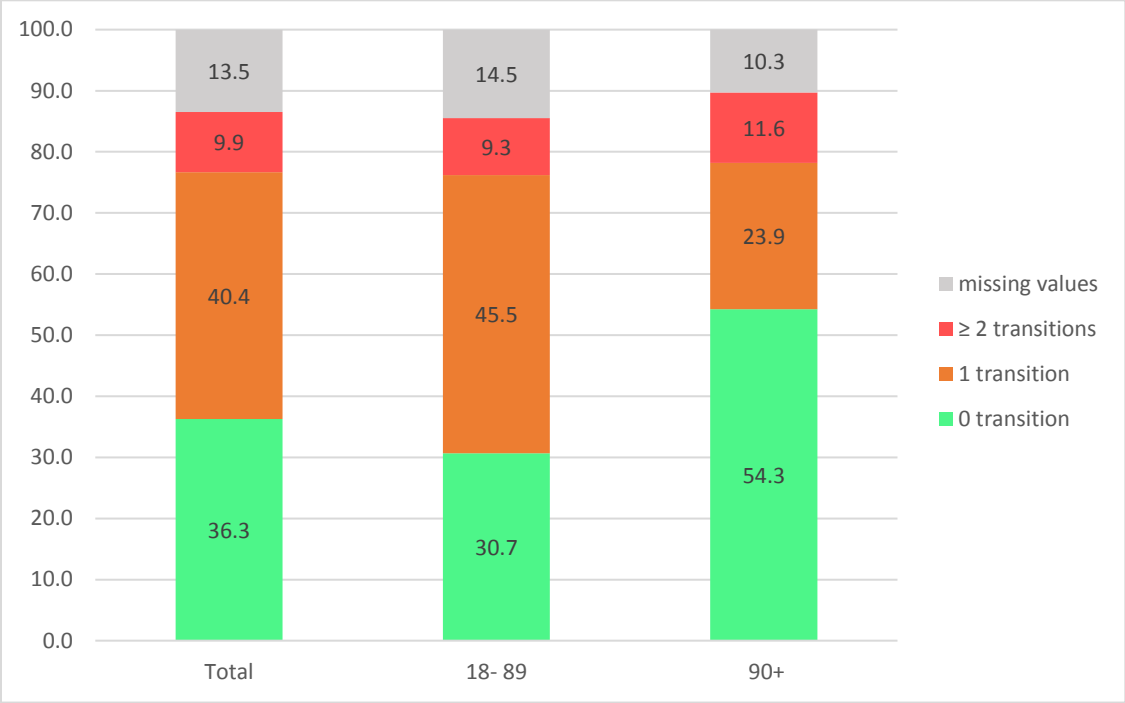
Table 2: Comparison of end-of-life decisions between nonagenarians and over with the rest of the population.

	Weighted N		Weighted colum %		X^2	p-value
	89 years old and under	90 years old and over	89 years old and under	90 years old and over		
Medical decision of end of life					61.2664	<0.0001
Treatment withheld	100.09	41.56	12.76	16.96		
Treatment withdrawn	31.50	8.77	4.02	3.58		
Intensification of treatment to alleviate symptoms	255.33	57.47	32.56	23.45		
Deep and continuous sedation until death	119.14	6.95	15.19	2.84		
Use of drugs to deliberate end life	10.11	3.49	1.29	1.42		
Decisions to prolong life	79.88	25.34	10.19	10.34		
Decisions without any consideration regarding death	81.21	26.52	10.35	10.82		
None of investigated decisions	106.96	74.97	13.64	30.59		
Treatments during last week before death					1.86	0.7624
For curative purpose only	142.80	49.47	18.21	20.19		
For palliative purpose only	390.85	111.26	49.84	45.40		
for curative and palliative purposes	190.06	66.62	24.24	27.18		
No treatment	28.87	8.39	3.68	3.42		
missing	31.64	9.33	4.03	3.81		

Transitions from one care setting to another in the 2 last months before death

Mainly nonagenarians stayed in the same place of care for the last two months of their lives, which is not the case for the rest of the population (54.25%VS 32.31%).(figure 2).

Figure 2 : **Transitions from one care setting to another in the 2 last months before death**



Work in progress : binomial and multinomial logistic regressions to determine if these age effects remains when controlled by characteristics of patients and patients.

DISCUSSION (work in progress)

This study is the first to investigate how the oldest old in overseas France die and to compare with the rest of the population. In the nonagenarian population, there is a higher proportion of women, many of whom have cognitive impairments, and the primary cause of death is cardiovascular disease. They have limited access to palliative care and mostly die at home. The certifying physicians are predominantly general practitioners with many years of experience, primarily working in private practice. Medical decisions regarding the intensification of treatments to relieve symptoms and the use of deep and continuous sedation until death are less common in patients over 90 years old. This study also highlights that nonagenarian patients rarely change their place of care during the last two months of life. It has been observed that these very old people die more at home and have less access to palliative care and

care to improve the management of these symptoms. This should lead us to reflect on how we took care of this part of the population.

CONCLUSION (to be confirmed)

This study is the first to investigate how the oldest old in overseas France die and to compare with the rest of the population. This study shows that patients aged over 90 are different from the general population both in terms of characteristics of the patients, of the characteristics of clinicians caring for them and its decisions. The main cause of death (cardiovascular disease) and the comorbidities of these patients (majority have moderate to severe cognitive impairment) are not the same as in the general population. They have limited access to palliative care and mostly die at home (with few changes of place of care). Medical decisions regarding the intensification of treatments to relieve symptoms and the use of deep and continuous sedation until death are less common in patients over 90 years old. The population of nonagenarians is quite specific in terms of causes of death and comorbidities. It seems essential to improve end-of-life care for these patients, particularly in terms of access to palliative care and management of discomfort symptoms. One area for improvement is training in the specificities of end-of-life care for these very elderly patients.

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