

**Social vulnerability and unmet preventive care needs in outpatients of two French public hospitals**

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**Sources of support:** This work was funded by the Programme Hospitalier de Recherche Clinique National and by a grant from the Fondation pour la Recherche M  dicale 2002-2003.

**Word count (main text): 2993**

**Running head :** Preventive care access and vulnerability

## **Abstract**

**Background:** Outpatients attending consultations at public hospitals may have unmet needs for preventive medical care. The present study aimed to identify and assess the association between these needs, social vulnerability, and mode of healthcare use.

**Methods:** In a multicentre epidemiological study, a group of socially vulnerable outpatients was compared with a non-vulnerable group in a sample of 1316 outpatients selected in hospital consultations, using a validated tool for detection of social vulnerability. Before the patient was seen by medical staff, investigators collected data on social characteristics, healthcare use and preventive medical care received (interventions and advice).

**Results:** More than 75% of outpatients stated that they were regularly followed by a physician, usually a general practitioner, but fewer vulnerable than non-vulnerable outpatients were followed (77% vs 89%,  $p < 10^{-3}$ ). For the majority of preventive interventions (vaccinations, screening for cardiovascular risk factors and gynaecological cancers), vulnerable outpatients presented a more marked shortage than non-vulnerable patients, but there was an overall shortage in both groups. When recommended preventive interventions had not been delivered, they had rarely been offered in either group. After adjustment for mode of healthcare use, the differences in preventive care received persisted to the disadvantage of vulnerable outpatients with regard to technical preventive interventions, but there was no difference between the two groups regarding advice received to reduce risk behaviours.

**Conclusion:** Unmet needs for preventive care primarily resulted from social inequalities in secondary access to such care. It may be necessary to set up specific interventions targeting vulnerable patients within hospital consultations.

**Keywords:** health inequalities, prevention, social vulnerability, healthcare use

## **Introduction**

The perceived health status of the French population is similar to that measured in our European neighbours,<sup>1</sup> but social inequalities are more marked for health indicators which are responsive to preventive interventions (general or medical) such as premature mortality and morbidity.<sup>2,3</sup> Various socio-economic determinants are considered to be at the origin of these inequalities, in particular social vulnerability. This is identified as a precarious economic situation justifying the allocation of welfare benefits and/or resulting in inadequate health coverage.<sup>4,5</sup> Social vulnerability influences health risk behaviours and attitudes to preventive medical care, as well as primary and secondary access to care.<sup>6</sup> Modes of healthcare use, related to the level of social protection or to the type of contact with the ambulatory or hospital healthcare offer (consultations, hospitalisation, follow-up), give rise to social inequalities in primary access to preventive care.<sup>7</sup> From the time preventive medical care needs are identified to the delivery of care, professionals may respond differently according to the socio-economic status of healthcare users. This leads to social inequality in secondary access to preventive care.<sup>8,9</sup>

In spite of policies aiming to increase the role of physicians in private practice, for the French population the public hospital has become a major pathway of primary access to care.<sup>10</sup> In fact, public hospitals mainly cover secondary care (primary care being the concern of the ambulatory sector), in particular through their outpatient clinics, which have expanded considerably during recent years.<sup>11</sup> These are essentially staffed by specialist physicians and include both outpatient and emergency consultations (80% of cases passing through emergency departments do not lead to hospital admission but to a consultation, after which the patient returns home).<sup>12</sup> For a proportion of the population, notably those who are socially vulnerable, these consultations are their main mode of access to care, or are even a regular

source of care.<sup>13,14</sup> In these conditions, do socially vulnerable persons receive the preventive care which is normally provided by physicians in private practice? We sought to investigate whether these persons have inadequate access to preventive medical care.

To the best of our knowledge, no previous study has specifically addressed the question of the level of preventive care received by outpatients, and socially vulnerable patients in particular, who attend the various types of outpatient clinics. This study aimed (1) to identify and assess the extent of unmet preventive medical care needs of outpatients attending public hospital consultations, according to vulnerability status and (2) to examine the association between these unmet needs, social vulnerability, and mode of healthcare use. A greater observed lack of preventive care in the socially vulnerable population would raise the question of the need to set up specific interventions under the hospital's responsibility.

## **Methods**

A retrospective cross-sectional epidemiological study comparing a socially vulnerable outpatient group with a non-vulnerable group was carried out in the two main public hospitals of the department of Loire Atlantique over a 12-month period from June 2003 to June 2004. Five hospital departments (the emergency department of Saint-Nazaire General Hospital and the emergency, odontology, gastroenterology and internal medicine departments of Nantes University Hospital) participated in the study. Analysis of the activity of these departments showed that they were mostly used by outpatients, whereas other departments were mainly concerned by the follow-up of diseases generally managed in a hospital setting, such as cancers.

To take into account the different natures of these departments and the demographic, social and medical diversity of the outpatient population, the sample size for each group was set at

650. The routine information collected when a patient arrives at an outpatient clinic is not sufficient to define his or her social vulnerability status. For this reason, socially vulnerable outpatients were identified by a screening tool validated for use in hospitals (sensitivity 70%, CI 64-76; specificity 77%, CI 71-82), in the form of a self-administered questionnaire.<sup>15</sup> Assessment of social vulnerability is based on five criteria: granting of universal health cover or state medical aid, absence of complementary health insurance, difficulty in paying for medical care, reception of social security benefits, unemployment of more than six months duration. Its qualities as a measurement instrument have been evaluated and published elsewhere.<sup>15,16</sup>

In all the participating departments and over a 10-week period, this questionnaire was given to all outpatients on arrival. In each department, successive vulnerable outpatients (up to 4 per day) were asked to participate in the study. Each respondent was paired by age (+/- 5 years) and gender with the next outpatient identified as non-vulnerable. Outpatients aged less than 15 years, or who were hospitalised at the end of the consultation, who could not be questioned due to their illness or their treatment, who refused to answer, or who were under tutelage or guardianship were excluded from the study.

Participating outpatients were then administered a standardised questionnaire (about 40 minutes) by a trained interviewer. The interview took place during the waiting period before the medical visit. The questionnaire covers socio-economic characteristics, healthcare use (type of physician first consulted for healthcare, regular medical follow-up (visit to a doctor at least once during the last three years), number of consultations (in private practice or at a hospital) and hospitalisations during the previous year, treatment for longstanding illness, preventive medical care received with reference to the recommendations of the French National Authority for Health (which promotes good healthcare practice) and of the High Council for Public Health (which evaluates prevention strategies and risk management)

concerning risk behaviours (tobacco, alcohol<sup>17</sup>), and also primary (vaccinations) and secondary (cardiovascular disease risk factors, screening for gynaecological cancers) preventive medical interventions carried out and/or proposed by physicians before the present consultation.

### *Statistical analysis*

First, to assess unmet preventive medical care needs according to vulnerability status, we performed descriptive analysis comparing preventive medical status between vulnerable and non-vulnerable outpatients. The proportions were compared using the chi<sup>2</sup> test or Mann-Whitney's test as appropriate. Secondly, logistic regression was used to test the hypothesis that non-performance of preventive medical interventions was due to secondary deficit of access to care. The dependent variable was the patient's status in relation to preventive medical care. In each case, the independent variable was social vulnerability status. Mode of healthcare use (regular medical follow-up and hospital admissions during the previous 12 months) and treatment for longstanding illness were the adjustment variables. Significant interaction between the independent and adjustment variables of the multivariate models was systematically sought. The results are presented as crude odds ratios and adjusted odds ratios with a 95% confidence interval. The tests used were two-tailed, with an alpha risk set at 5%. Statistical analysis was performed with SAS<sup>®</sup> 9.1 software (descriptive analysis) and R 2.6.2 software (multivariate analysis).

## **Results**

During the study period, 2130 out of 9726 outpatients were identified as socially vulnerable (21.9%); 740 were selected and 658 were included and matched with outpatients identified as non-vulnerable. Among the patients excluded (82 vulnerable, 58 non-vulnerable), half of the

vulnerable patients declined to take part in the interview, with no difference between the two groups. The two groups comprised a total of 1316 outpatients, of whom 31.5% attended the emergency department of Nantes Hospital and 30.1% the emergency department of Saint-Nazaire Hospital, 19.8% odontology, 15% gastroenterology and 3.6% the internal medicine consultations of Nantes Hospital. Their mean age was  $37.8 \pm 14.3$  years and 51.2% were men.

### ***Socio-economic characteristics and health care system use (table 1)***

Social vulnerability is multi-dimensional, and socio-demographic characteristics differed markedly between the two groups. Vulnerable outpatients were significantly more likely to live alone, to have a low education level, to be born abroad (20.2% vs 5.5%,  $p < 10^{-3}$ ), to have difficulty in speaking (7.9% vs 2.7%,  $p < 10^{-3}$ ) and reading French (12.4% vs 1.9%,  $p < 10^{-3}$ ) and to lack social support (20.5% vs 4.5%,  $p < 10^{-3}$ ). They were more likely to be workers and employees, to be in part-time employment and on a fixed-term contract (38.9% vs 14.1%,  $p < 10^{-3}$ ).

Fewer vulnerable patients reported regular medical follow-up in the last 12 months (77.2% vs 89.4%,  $p < 10^{-3}$ ) and they were less likely to be followed in private practice (98.5% vs 98.0%,  $p = 0.380$ ). However the number of visits in the last 12 months was higher among vulnerable patients (8.5 vs 5.8 consultations,  $p < 10^{-3}$ ), and they were more likely to have been hospitalised during the previous year (35.5% vs 26.7%,  $p < 10^{-3}$ ). The differences observed persisted after adjustment for treatment for longstanding illness (the frequency of such treatment did not differ between the two groups).

### ***Social vulnerability and preventive medical care (table 2)***

Socially vulnerable respondents were more likely to be tobacco and alcohol abusers. Socially vulnerable smokers expressed less intention to stop smoking than non-vulnerable smokers

(35.1% vs 41.3%,  $p < 10^{-3}$ ). Socially vulnerable alcohol abusers were more likely to express the need to reduce or stop their alcohol consumption. Physician counselling on alcohol or tobacco use was infrequent and did not differ between the two groups.

For the majority of recommended preventive medical interventions, socially vulnerable outpatients showed greater shortage than non-vulnerable outpatients both for primary preventive (vaccinations: tetanus, poliomyelitis and hepatitis B) and secondary preventive interventions (screening for cardiovascular risk factors and gynaecological cancers).

Concerning screening for cardiovascular risk factors, although the majority of outpatients reported that they had their blood pressure taken, fewer vulnerable outpatients were aware of their blood pressure levels. Concerning recommended laboratory tests, serum cholesterol and glycaemia were less likely to have been measured in vulnerable outpatients. When these measurements had not been done, they had been proposed by a physician in less than 5% of cases, with no difference between the two groups.

At ages when mammograms and cervical smears are recommended in women, the majority of mammograms had been performed within the recommended three-year interval, with no difference between the two groups, whereas among vulnerable women cervical smears had more often been performed after an interval of over three years.

#### ***Association between social vulnerability and preventive medical care (tables 3, 4)***

After adjustment for mode of healthcare use, the differences in preventive medical care according to social vulnerability persisted, to the disadvantage of vulnerable outpatients for all preventive medical interventions.

#### ***Association between healthcare use and preventive medical care (tables 3, 4)***

In smokers and excessive drinkers, no association was found between regular follow-up or



hospitalisation during the previous 12 months and advice given to reduce or stop tobacco or alcohol use.

With regard to vaccinations and screening for cardiovascular and cervical cancer risk factors, the association with regular medical follow-up persisted after adjustment variables had been taken into account, except for vaccination against rubella.

Hospital admission during the 12 months prior to the survey showed little association with screening for cardiovascular risk factors (with the exception of blood pressure measurement during the previous year and knowledge by the outpatient of its values, and glycaemia testing among outpatients under 50 years) or on having had a cervical smear within the recommended interval (women aged 20-65 years).

## **Discussion**

The screening tool, whose items mainly relate to economic considerations, significantly differentiated all the socio-economic and occupational characteristics of the two groups which were compared, thus validating the comparisons made. The preventive medical interventions or advice delivered by a physician may be underestimated in both groups due to recall or report bias. The patients' declarations were collected in a long interview and referred to events occurring over a period of several years. The mode of data collection selected, by interview just before attending consultation, may have led to decreased attention, principally in emergency departments, and memory bias may possibly have led uncertain respondents to choose the response "no" or "don't know". The latter response was taken as negative for the purposes of analysis, because in clinical practice if an outpatient cannot produce proof of a preventive intervention, it is considered by the physician as not having been carried out. Moreover, we cannot exclude the possibility that memory or reporting bias may differ

between the two groups, particularly as educational level and understanding of French was lower in the vulnerable patients. However, we found that for mammography which is done after organised screening, we observed no difference between vulnerable and non-vulnerable patients. This would tend to indicate that any reporting bias was limited.

Our findings showed that the socially vulnerable population reported a greater shortage of medical prevention than the non-vulnerable population, principally in terms of vaccination cover, screening for cardiovascular disease risk factors, and screening for cervical cancers in women. However, although the level of preventive care appeared higher among non-vulnerable outpatients, there was an overall shortage of prevention in both groups at the time of attending the hospital consultations. Nevertheless, more than 75% of outpatients stated that they had regular medical follow-up, most often by a general practitioner. Regular follow-up was associated with better preventive cover, whatever the patient's social status. The results also show that the shortage persisted for overall preventive medical interventions after adjustment for mode of healthcare use, and that it was more marked in socially vulnerable patients. These findings suggest that the observed shortage of medical prevention results above all from social inequalities in secondary access to preventive care.

Regular medical follow-up, generally provided in the outpatient sector, was correlated with better preventive care, but not with improved counselling on alcohol abuse and smoking. This is consistent with French and European findings which report that general practitioners feel more at ease in carrying out technical interventions than in dealing with behavioural problems.<sup>18,19</sup> The possible explanations of this situation are complex and probably depend to a large extent on how these physicians perceive of their role regarding addictive behaviours.<sup>20,21</sup> Explanations are also linked to the differential quality of physician-patient

communication, intensified by the patient's social status and that of the physician.<sup>22</sup> Behavioural interventions take time and may not be possible during a short medical visit (15 minutes), especially when the patient requests attention for another symptom or disorder and expects a technical or a medical response.<sup>23</sup> The system of encounter-based payment in private practice in France does not sufficiently compensate for the considerable time necessary for behavioural prevention.<sup>24</sup>

Difficulties reported by general practitioners in private practice are perhaps greater than or different from those of physicians working in hospital consultations. Recourse to specialist physicians responds to specific diagnostic and therapeutic needs of outpatients who are followed up in the long term by their attending physician. Specialist physicians are much more focused on the demand for curative care and because of their position in the care system they are not expected to develop a preventive approach. This is particularly true in emergency departments where healthcare professionals are subjected, in addition to work overload, to a contradictory demand: that of the managers who ask them to concentrate on diagnosis, care and orientation in emergency situations, and that of the increasing presence of a patient population in search of primary care. In order to deal with this situation and to provide access to primary care, permanent healthcare access facilities ("permanences d'accès aux soins de santé", PASS) have gradually been set up in hospitals.<sup>25</sup> These facilities provide integrated general and social medicine consultations and deliver curative and preventive primary care to the more vulnerable outpatients referred from emergency departments, in particular to those without full health insurance. However, this consultation is often isolated and poorly coordinated with the other consultations. It still remains to bring together, on a federative model, those hospital consultations which more specifically address the socially vulnerable patients in order to promote shared expertise in the management of this population and to

propose targeted catch-up preventive interventions. This should be done in relation with networks of professionals both outside the hospital (associations, physicians in private practice, municipal health services) and within it (preventive consultations for addictology, comprehensive vaccinations).

Our study has not attempted to investigate how hospitals could reduce social inequalities in secondary access to preventive care. However, our findings enable us to suggest that hospitals could re-think their complementary missions through the creation of a coordinated facility for preventive primary care, in order to ensure that this care is followed through. Various perspectives on the development of such a project could be considered and would deserve to be evaluated. Detection of social vulnerability during care provision could be improved and/or integrated in the hospital's computerised data systems.<sup>15,16</sup> Detection would serve as a warning light when preventive care is needed. It would enable the physician to provide targeted information along the lines of brief preventive counselling,<sup>26</sup> to suggest to the patient an appropriate preventive consultation in the hospital or to propose that he or she should discuss the problem with their general practitioner, to develop sharing of information with the patient (completion of his or her "lifestyle profile") in the waiting rooms or special interactive areas in the hospital, and suggesting discussion with the general practitioner<sup>27</sup>.

## Conclusion

In France, catch-up of preventive medical care of the population and of social inequalities in secondary access to preventive care are principally the responsibility of primary care in the outpatient sector and of general medicine in particular. However, in a more universal way this raises the question of how to help ambulatory and hospital physicians to better integrate

preventive care and management of vulnerable patients into their practice, and how to adapt such care to the time they have available, to changes in their practice, to their perception of preventive care and how it should be remunerated. Various changes that should be implemented have already been identified. These are the establishment of appropriate professional guidelines which would integrate a preoccupation with equity and would take more account of individual psychosocial risk factors and determinants of adherence,<sup>28</sup> the development of interviewing techniques such as brief opportunistic preventive counselling or motivational interviewing,<sup>29</sup> work on the attitudes and behaviours to be adopted toward the vulnerable patient population in order to improve physician-patient communication and to deliver more appropriate information,<sup>30</sup> and development of tools for follow-up of medical procedures and services<sup>31</sup>. These changes should necessarily introduce identification and/or increased remuneration of preventive interventions and a flat rate payment for preventive counselling.<sup>32</sup>

## **Acknowledgments**

The authors would like to acknowledge the help provided by the medical staff of the hospitals of Nantes and Saint-Nazaire and by members of the steering committee: Prof. Ballereau, Prof. Barrier, Dr Berranger, Prof. Galmiche, Dr Grinand, Prof. Guimelli, Prof. Laboux, Dr Libeau, Mrs Pasquier, Dr Pouliquen, Mrs Vachet.

**Conflicts of interest** : None declared

## **Key points**

Previous healthcare use confers a higher level of prevention in terms of technical interventions delivered.

Socially vulnerable outpatients, even those who stated that they have regular medical follow-up received less preventive care than non-vulnerable patients.

Few preventive interventions were delivered and little advice on reducing risk behaviours was offered.

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**Table 1 Socio-economic characteristics, long-standing illness and healthcare use among socially vulnerable and non-vulnerable outpatients.**

		Value	Socially vulnerable		Non-socially vulnerable		P
			N	%	N	%	
<b>Socio-economic characteristics</b>							
<b>Family situation</b>		Single	235	35.	177	26.	<0.00
		Divorced, separated or widowed	184	7	83	9	1
		Living with partner	239	28.	398	12.	
				0		7	
				36.		60.	
<b>Education level</b>		≥ Higher secondary	126	19.	266	40.	<
		Lower secondary	334	2	304	4	0.001
		≤ Primary	197	50.	88	46.	
				8		2	
				30.		13.	
<b>Socio-professional category</b>		Managers and highly educated professionals	14	2.1	51	7.9	<
		Artisans, merchants, chief executives	69	10.	145	22.	
		Intermediate professions	258	31.	158	27.	
		Employees	7	3	8	0	
		Workers		39.		24.	
		Farm managers		2		3	
<b>Professional activity</b>		Full-time	69	10.	372	56.	<0.00
		Part-time	57	5	68	8	1
		None	531	8.7	215	10.	
				80.		4	

				8	32.	
<b>Social support *</b>	No support from family or friends	135	20.	28	4.3	<0.00
	At least one source of support	522	5	630	95.	1
			79.		7	
			5			
<b>Healthcare use</b>						
<b>Type of physician first consulted</b>	Physician in private practice	523	86.	601	97.	<0.00
	Hospital physician	82	4	16	4	1
	<i>if private = general practitioner</i>	514	13.	589	2.6	
	<i>if hospital = emergencies</i>	52	6	10	98.	0.380
	<i>other department</i>	27	98.	5	0	0.950
			5		66.	
			65.		7	
			8		33.	
			34.		3	
			2			
<b>Regular medical follow-up</b>	Yes	508	77.	588	89.	<0.00
**	No	150	2	70	4	1
	<i>If yes, general practitioner in private practice</i>	463	22.	567	10.	
			8		6	<0.00
			91.		96.	1
			5		8	
<b>Consultation during the last 12 months</b>	Number	8.5		5.8		<0.00
<b>Hospitalisation during the last 12 months</b>	Yes	233	35.	175	26.	<0.00
	No	424	5	480	7	1
			64.		73.	
			6		3	
<b>Treatment for longstanding illness</b>	Yes	290	44.	265	40.	0.169
	No	368	0	393	2	
			56.		59.	
			0		8	

\* Support in terms of accommodation, moral or financial support in the event of difficulties.

*\*\* Visit to a physician at least once a year during the last three years.*

**Table 2 Preventive status among vulnerable and non-vulnerable outpatients**

		Value	Socially		P			
			vulnerable	Non-socially				
			N	%	N	%		
<b>Health behaviour</b> <b>Tobacco consumption</b>	Smoker		408	62.	326	49.	<0.00	
	Non-smoker		250	0	329	8	1	
	<i>If smoker, intention to stop</i>		142	38.	133	50.		
	<i>If smoker, help has been offered by a physician</i>		50	0	41	2	<0.00	
				35.		41.	1	
				1		3	0.724	
				16.		17.		
				2		4		
				211	32.	116	17.	<0.00
				441	4	538	7	1
<b>Alcohol consumption</b> <i>(Cage)</i>	Alcohol problem		211	32.	116	17.	<0.00	
	No alcohol problem		441	4	538	7	1	
	<i>If yes, feel need to reduce</i>		152	67.	82	82.		
	<i>If yes, help has been offered by a physician</i>		57	6	31	3	<0.00	
				23.		12.	1	
				3		5	0.963	
			37.		37.			
			5		8			
<b>Vaccinations performed</b> <b>Tetanus</b>	Yes		543	82.	607	92.	<0.00	
	No		114	6	51	2	1	
	<i>If yes, ≤ 10 years previously</i>		388	17.	466	7.8		
				3		77.	0.100	
				72.		0		
<b>Polio</b>	Yes		418	63.	535	81.	<0.00	
	No		239	6	123	3	1	
	<i>If yes, ≤ 10 years previously</i>		245	36.	378	18.		
				3		7	0.001	

			56.	69.		
<b>Hepatitis B</b>	Yes	217	33.7	272	41.0	0.001
	No	441	0	386	3	
			67.		58.	
<b>Rubella</b> (women aged 15 to 45 years)	Yes	82	36.0	104	46.7	0.054
	No	145	1	121	2	
			63.		53.	
<b>Influenza</b> (outpatients over 65 years)	Yes	20	69.9	23	82.8	0.248
	No	9	0	5	1	
			31.		17.	
			0		9	
<b>Surveillance of cardiovascular risk factors</b>						
<b>Blood pressure tested during the year</b>	Yes	635	97.	649	99.	0.003
	No	16	5	3	5	
	<i>If yes, knowledge of its level</i>	446	2.5	532	0.5	<0.00
			71.		82.1	
<b>Serum cholesterol tested</b>	Yes	305	46.0	396	60.2	<0.00
	No	351	4	261	3	1
	<i>If no, help has been offered by a physician</i>	10	53.6	9	39.7	0.720
<b>Glycaemia tested</b>	Yes	316	48.3.5	377	57.4.1	<0.00
	No	341	1	279	5	1
	<i>If no, help has been offered by a physician</i>	8	51.9	10	42.5	0.380
<b>Regular physical activity</b>	Yes	171	26.3.1	269	40.4.7	<0.00
	No	487	0	389	9	1

		<i>If no, help has been suggested by a physician</i>	130	74.	134	59.		
				0		1	0.011	
				27.		35.		
<b>Nutritional advice received</b>	Yes		279	42.	302	45.	0.202	
	No		379	4	356	9		
				57.		54.		
				6		1		
<b>Cancer screening (women only)</b>								
<b>Cervical smear performed</b>	Yes		228	82.	248	89.	0.016	
	No		50	0	30	2		
<i>(women aged 20 to 65 years)</i>	<i>If yes ≤ 3 years</i>		173	18	208	10.	0.036	
	<i>If no, help has been offered by a physician</i>		4	76.	6	8	0.147	
				2		83.		
				9.5		9		
						26.		
						1		
<b>Mammography performed</b>	Yes		37	72.	51	91.	0.012	
	No		14	5	5	1		
<i>(women aged 50 to 69 years)</i>	<i>If yes ≤ 3 years</i>		28	27.	38	8.9	0.641	
	<i>If no, help has been offered by a physician</i>		5	5	4	809	0.284	
				82.		80.		
				4		0		
				41.				
				7				

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**Table 3 Vaccination and vulnerability status - adjustment for regular follow-up, hospitalisation and longstanding illness\*\***

	<b>Value N=131</b>	<b>Crude OR Tetanus : Yes vs No</b>	<b>95% CI</b>	<b>Adjusted OR Tetanus : Yes vs No</b>	<b>95% CI</b>
	<b>6</b>				
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.39	[0.27-0.55]	0.46	[0.31-0.66]
<b>Regular medical follow-up</b>	No	1		1	
	Yes	3.31	[2.19-4.98]	2.73	[1.76-4.23]
<b>Hospitalisation</b>	No	1		1	
	Yes	1.74	[1.27-2.39]	0.86	[0.58-1.26]
<b>during the last 12 months</b>					
<b>Treatment for</b>	No	1		1	
	Yes	1.35	[0.93-1.96]	1.29	[0.86-1.93]
<b>longstanding illness</b>	Yes <b>(N=13)</b>	<b>Polio : Yes vs No</b>		<b>Polio : Yes vs No</b>	
	<b>16)</b>				
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.42	[0.33-0.52]	0.44	[0.35-0.56]
<b>Regular medical follow-up</b>	No	1		1	
	Yes	1.94	[1.42-2.66]	1.63	[1.16-2.28]
<b>Hospitalisation</b>	No	1		1	
	Yes	0.77	[0.60-0.99]	0.78	[0.60-1.02]
<b>during the last 12 months</b>					
<b>Treatment for</b>	No	1		1	
	Yes	1.18	[0.93-1.50]	1.27	[0.98-1.65]
<b>longstanding illness</b>	Yes <b>(N=13)</b>	<b>Hepatitis B : Yes vs No</b>		<b>Hepatitis B : Yes vs No</b>	
	<b>16)</b>				
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.65	[0.51-0.82]	0.71	[0.55-0.91]
<b>Regular medical follow-up</b>	No	1		1	
	Yes	1.98	[1.40-2.80]	1.86	[1.29-2.68]
<b>Hospitalisation</b>	No	1		1	
	Yes	0.85	[0.65-1.11]	0.92	[0.69-1.22]
<b>during the last 12 months</b>					
<b>Treatment for</b>	No	1		1	
	Yes	0.81	[0.62-1.03]	0.76	[0.56-0.99]
<b>longstanding illness</b>	Yes <b>(N=45)</b>	<b>Rubella (&lt;45 years) : Yes vs</b>		<b>Rubella (&lt;45 years) : Yes vs</b>	
	<b>3)</b>	<b>No</b>		<b>No</b>	

<b>Socially vulnerable</b>	No	1	1
	Yes	0.65 [0.44-0.95]	0.65 [0.44-0.96]
<b>Regular medical follow-up</b>	No	1	1
	Yes	1.28 [0.70-2.34]	1.11 [0.59-2.09]
<b>Hospitalisation during the last 12 months</b>	No	1	1
	Yes	1.10 [0.71-1.67]	1.16 [0.75-1.81]
<b>Treatment for longstanding illness</b>	No	1	1
	Yes	0.97 [0.65-1.44]	0.94 [0.62-1.42]
	<b>(N=11 Cervical smear (women aged 20 to 65 years): Yes vs No</b>		<b>Cervical smear (women aged 20 to 65 years): Yes vs No</b>
<b>Socially vulnerable</b>	No	1	1
	Yes	0.52 [0.31-0.86]	0.56 [0.33-0.95]
<b>Regular medical follow-up</b>	No	1	1
	Yes	2.98 [1.55-5.72]	2.46 [1.23-4.94]
<b>Hospitalisation during the last 12 months</b>	No	1	1
	Yes	1.91 [1.02-3.57]	2.02 [1.05-4.89]
<b>Treatment for longstanding illness</b>	No	1	1
	Yes	1.36 [0.81-2.28]	1.08 [0.62-1.88]

\* *Influenza vaccination : non-significant difference*

\*\* *Mammography: non-significant difference*

**Table 4 Screening for cardiovascular risk factors and vulnerability status - adjustment for regular follow-up, hospitalisation and longstanding illness**

	<b>Value (N=13 16)</b>	<b>Crude OR Knowledge of BP : Yes vs No</b>	<b>95% CI</b>	<b>Adjusted OR Knowledge of BP : Yes vs No</b>	<b>95% CI</b>
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.51	[0.39-0.67]	0.54	[0.41-0.72]
<b>Regular medical follow-up</b>	No	1		1	
	Yes	3.68	[2.64-5.14]	2.98	[2.1-4.24]
<b>Hospitalisation during the last 12 months</b>	No	1		1	
	Yes	1.74	[1.27-2.39]	1.74	[1.24-2.44]
<b>Treatment for longstanding illness</b>	No	1		1	
	Yes	1.49	[1.11-2.01]	1.12	[0.82-1.56]
	<b>(N=13 16)</b>	<b>cholesterolemia : Yes vs No</b>		<b>cholesterolemia : Yes vs No</b>	
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.52	[0.40-0.66]	0.45	[0.62-0.70]
<b>Regular medical follow-up</b>	No	1		1	
	Yes	2.73	[1.92-3.88]	2.00	[1.38-2.89]
<b>Hospitalisation during the last 12 months</b>	No	1		1	
	Yes	1.28	[0.98-1.74]	1.24	[0.93-1.64]
<b>Treatment for longstanding illness</b>	No	1		1	
	Yes	1.49	[1.16-1.93]	1.28	[0.97-1.68]
	<b>(N=13 16)</b>	<b>Glycaemia : Yes vs No</b>		<b>Glycaemia : Yes vs No</b>	
<b>Socially vulnerable</b>	No	1		1	
	Yes	0.66	[0.52-0.84]	0.67	[0.53-0.87]

<b>Regular medical follow-up</b>	No	1	1
	Yes	2.59 [1.84-3.66]	1.92 [1.33-2.75]
<b>Hospitalisation during the last 12 months</b>	No	1	1
	Yes	1.51 [1.17-1.96]	1.39 [1.06-1.83]
<b>Treatment for longstanding illness</b>	No	1	1
	Yes	1.73 [1.35-2.22]	1.45 [1.11-1.89]
<b>(N=87 Physical activity : Yes vs Physical activity : Yes vs</b>			
<b>6) No No</b>			
<b>Socially vulnerable</b>	No	1	1
	Yes	0.68 [0.50-0.92]	0.74 [0.54-1.01] *
<b>Regular medical follow-up</b>	No	1	1
	Yes	2.25 [1.39-3.64]	2.15 [1.31-3.54] *
<b>Hospitalisation during the last 12 months</b>	No	1	1
	Yes	1.14 [0.83-1.57]	1.21 [0.87-1.69]
<b>Treatment for longstanding illness</b>	No	1	1
	Yes	0.79 [0.58-1.10]	0.73 [0.52-1.01]
<b>(N=87 Nutritional advice : Yes vs Nutritional advice : Yes vs</b>			
<b>6) No No</b>			
<b>Socially vulnerable</b>	No	1	1
	Yes	0.87 [0.69-1.09]	0.86 [0.68-1.09]
<b>Regular medical follow-up</b>	No	1	1
	Yes	1.63 [1.18-2.26]	1.31 [0.93-1.85] **
<b>Hospitalisation during the last 12 months</b>	No	1	1
	Yes	1.29 [1.01-1.65]	1.14 [0.88-1.48]
<b>Treatment for longstanding illness</b>	No	1	1
	Yes	1.72 [1.35-2.22]	1.60 [1.24-2.06]

\* After taking into account interaction between social vulnerability and regular medical follow-up ( $p < 0.002$ ) social vulnerability was significant ( $p < 0.001$ ) and regular medical follow-up remained significant ( $p = 0.03$ )

\*\* After taking into interaction between treatment for longstanding illness and regular medical follow-up ( $p < 0.003$ ) regular medical follow-up and consultation during the last 12 months were significant ( $p = 0.005$ ,  $p = 0.045$ )