

# **INFLUENCE OF DAYCARE ATTENDANCE ON MORBIDITY IN CHILDREN BETWEEN ZERO AND TWO YEARS OF AGE**



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**It is an adaptation for Asturias designed by the investigation group of the Spanish  
Association of Primary Care Pediatrics (AEPap).**



## INFLUENCE OF DAYCARE ATTENDANCE ON MORBIDITY IN CHILDREN BETWEEN ZERO AND TWO YEARS OF AGE

### Collaborative Research Group

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Thanks to Elizabeth Hovel and Tania Iglesias Cabo

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## OBJETIVE

**To evaluate the influence of daycare attendance on the risk of infections in children under two years of age.**

**To compare differences in the use of drugs depending on their assistance or not to day care and the age they began to go**



## Population and Methods

### Prospective longitudinal study

**Participants:** two cohorts of children between zero and two years of age whose difference is the attendance of some to daycare (exposition factor).

**Realized by:** 33 pediatricians and 20 nurses from the Public Health Service of the Principality of Asturias.

**Target population:** children under 2 years who attended the offices of the participating health centers.

**Sample size:** 1168 to begin with, taking into account the incidence of pneumonia.

**Inclusion criteria:** children born between the 1<sup>st</sup> of January and 30<sup>th</sup> of September, 2010.

**Exclusion criteria:** children presenting serious chronic diseases



## MATERIAL AND METODS

### Variables in the study:

**Independent variable:** attendance to childcare centre (dichotomous qualitative variable) which defines both cohorts

### **Dependent variable:**

- Number of infections** that generate medical visits (quantitative discrete variable)
- Type of infection** (qualitative policotomic variable)



**Data** were obtained from computerized medical records and parent interviews realized at 6, 12, 18 and 24 months of age, in scheduled routine check-ups.

**Statistical analysis** version 2.14 of R statistical software (R Development Core Team 2011)

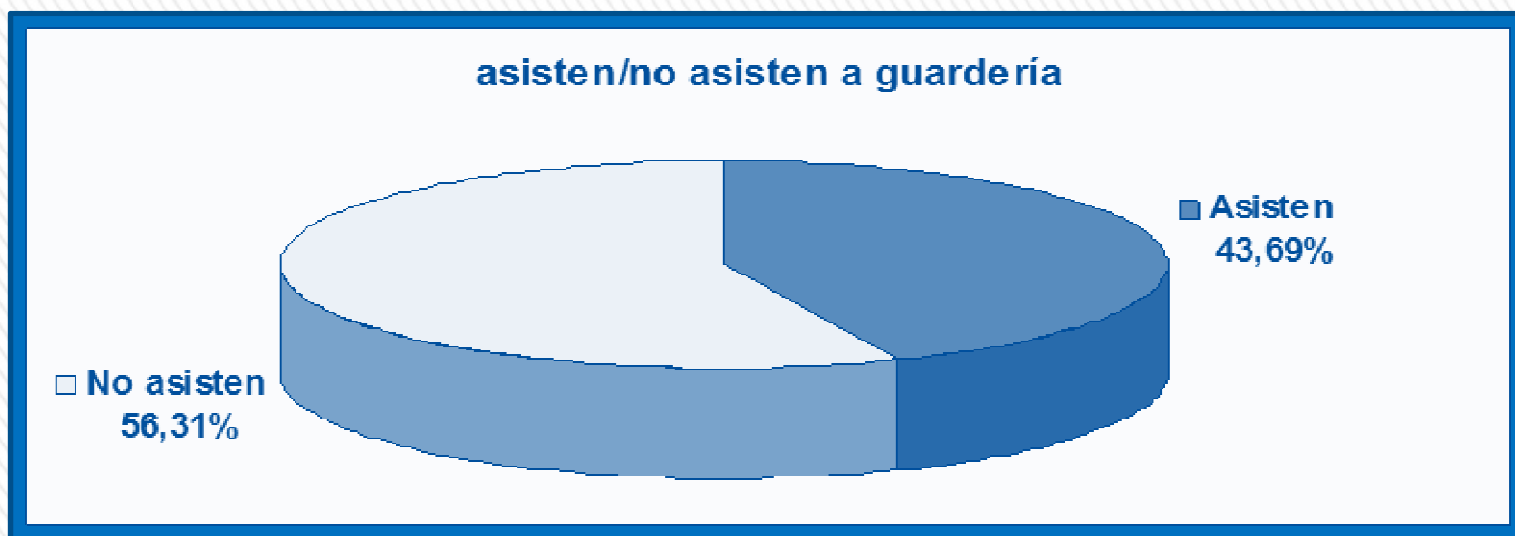
The relationship between daycare attendance and factors studied was analyzed using the **Pearson chi-squared** test.

To analyze the quantitative variables the **Student's t-test** or the **Welch test** were used.

It was carried out by the Statistical Consulting Unit of the Oviedo's University.<sup>6</sup>

## RESULTS

Total number of children: 975



 Do attend kindergarden 56, 31%

 Do not attend kindergarden 43, 69 %



**Results:  
evaluated parametres  
in each cohort**

**Children who  
attended daycare**

**Children who did NOT  
attend day care**

**Posibility of  
having one or  
more disease**

**Average number  
of diseases  
episodes suffered**

**Relative risk for  
each disease**

**Drugs consumed**



## DISEASES - ATTEND /NOT ATTEND DAY CARE

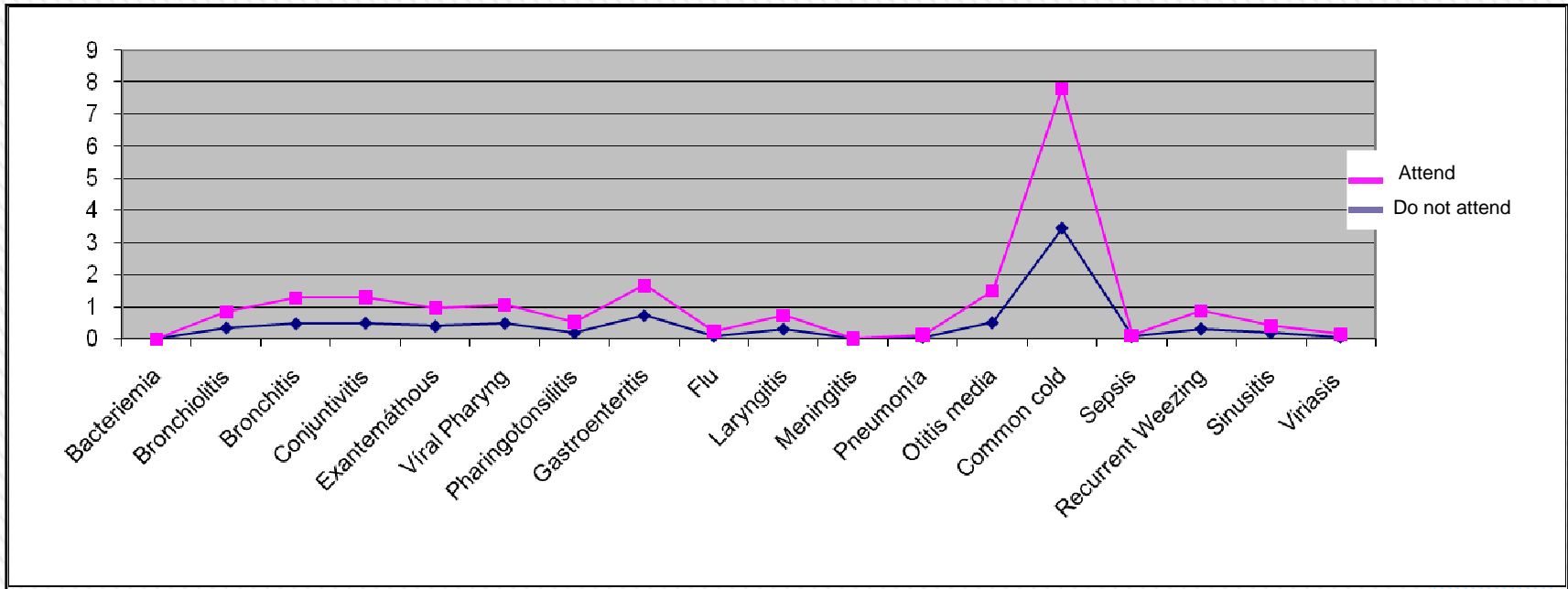
	Children who do NOT attend day care. % Who suffer any disease N=549	Children who do attend day care. % Who suffer any disease N= 426	p-value <0,05	Average number of episodes children who do NOT attend daycare N=549	Average number of episodes children who do attend daycare N=426	p-value <0,05	Relative risk for each disease	Confidence interval (CI) -	Confidence interval (CI) +
Bacteremia	0,04	0,9	0,399	0	0,01	0,23	2,58	0,47	1,4
Bronchiolitis	25,8	37,1	0,005	0,34	0,51	0,00	1,43	1,19	1,73
Bronchitis	27,8	44,1	0,000	0,47	0,82	0,00	1,57	1,33	1,87
Conjunctivitis	32,8	48,8	0,000	0,49	0,81	0,00	1,46	1,26	1,71
Exantemathous viral dis.	27,8	40,8	0,001	0,39	0,58	0,00	1,46	1,23	1,75
Viral Pharyngitis	32,1	35,2	0,362	0,48	0,59	0,07	1,11	0,93	1,33
Pharyngotonsillitis	13,3	23,2	0,000	0,18	0,35	0,00	1,77	1,34	2,33
Gastroenteritis	45,7	57	0,019	0,72	0,95	0,00	1,25	1,11	1,42
Flu	7,9	12	0,151	0,09	0,15	0,03	1,49	1,02	2,19
Laryngitis	21,3	26,3	0,204	0,3	0,43	0,01	1,23	0,98	1,55
Meningitis	0,9	0,9	0,636	0,01	0,01	0,82	1,03	0,28	3,81
Pneumonía	3,4	8	0,016	0,04	0,09	0,01	2,31	1,33	3,98
Media otitis	29,4	48,8	0,000	0,5	1	0,00	1,64	1,39	1,93
Common cold	90,5	93,7	0,010	3,46	4,35	0,00	1,03	0,99	1,07
Sepsis	4,1	4,5	0,946	0,06	0,06	0,83	1,11	0,61	2,03
Recurrent wheezing	12,4	20,9	0,061	0,31	0,57	0,00	1,69	1,26	2,25
Sinusitis	6,8	10,6	0,357	0,18	0,22	0,55	1,53	1,01	2,3
Virasis	4,5	8,5	0,008	0,05	0,09	0,02	2,07	1,21	3,35

**PATOLOGIES WITHOUT STATISTICAL SIGNIFICANCE:  
NO SIGNIFICANCE DIFFERENCE BETWEEN THE CHILDREN WHO  
ATTENDED DAYCARE AND THOSE THAT DIDN'T FOR THESE FOUR  
DISEASES**

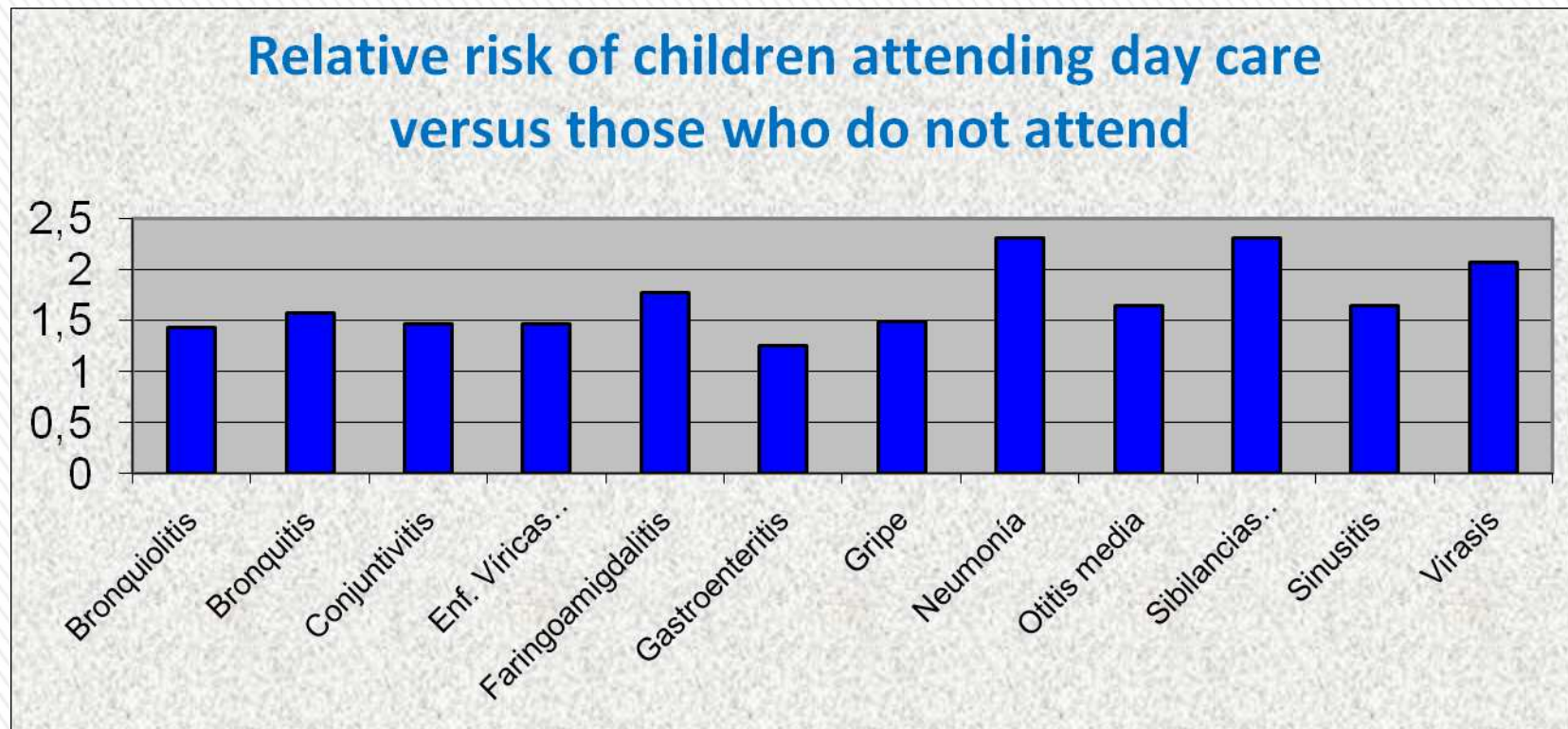
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<b>Bacteriemia</b>	0,04	0,9	0,399	0	0,01	0,23	2,58	0,47	1,4
<b>Virial Pharyngitis</b>	32,1	35,2	0,362	0,48	0,59	0,07	1,11	0,93	1,33
<b>Meningitis</b>	0,9	0,9	0,636	0,01	0,01	0,82	1,03	0,28	3,81
<b>Sepsis</b>	4,1	4,5	0,946	0,06	0,06	0,83	1,11	0,61	2,03

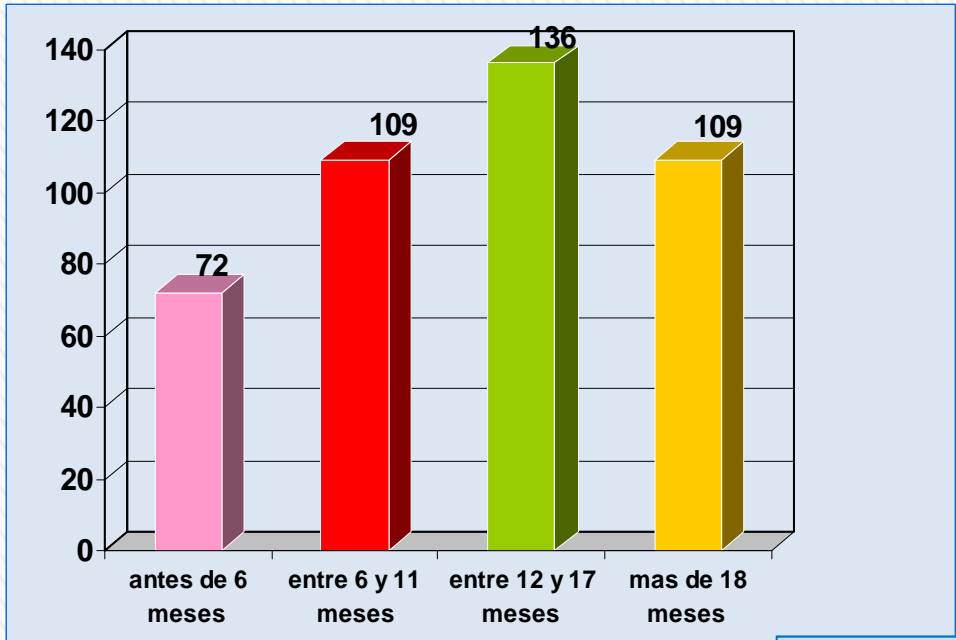


## Comparison between the average number of episodes of different pathologies presented by the children attending and not attending daycare



## RELATIVE RISK WITH STATISTICAL SIGNIFICANCE

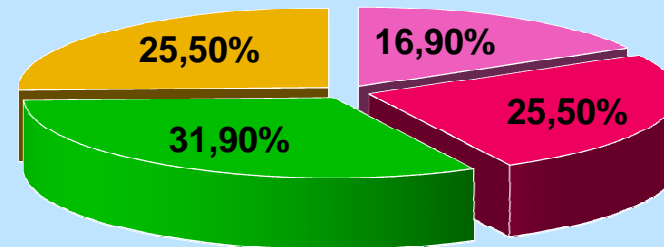




Children attending day care: number and percentage by age of onset grouped by six-month periods.

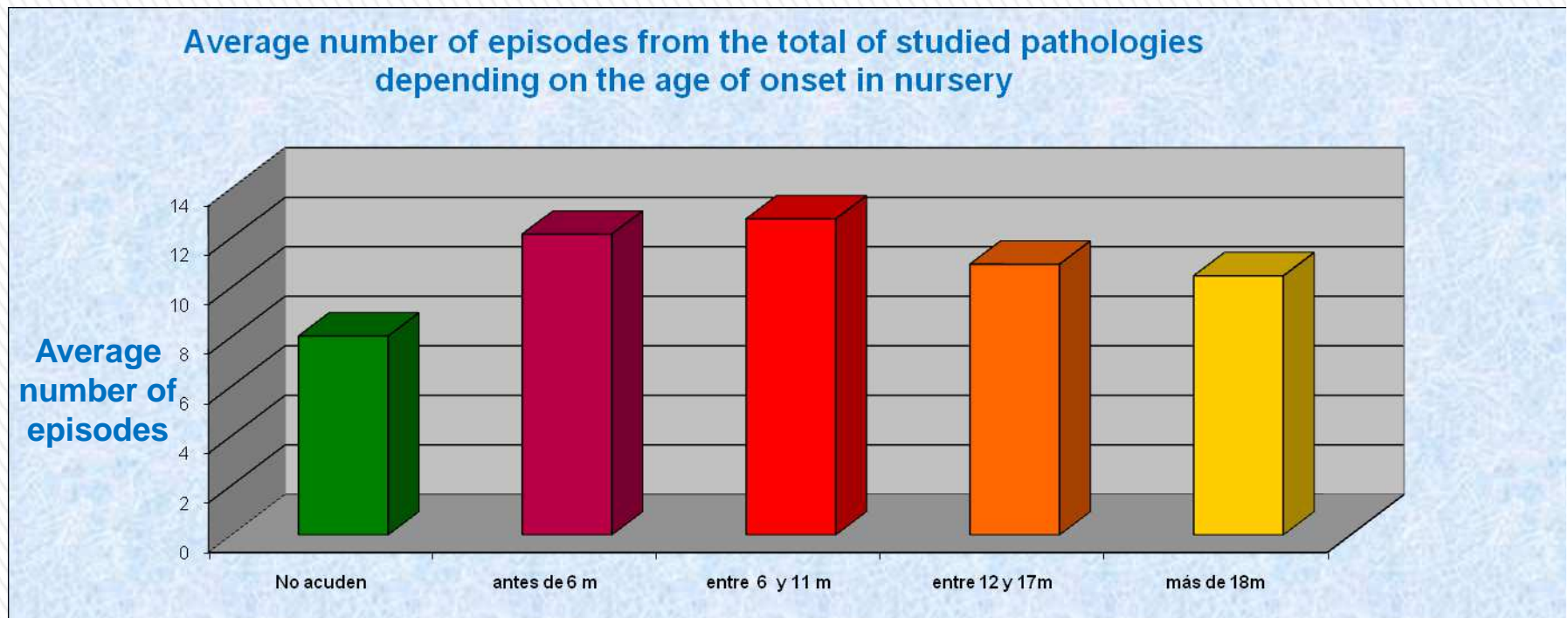
- Before 6 months
- 7-11 months
- 12-17 months
- More than 18 months

### Percentage by age of onset



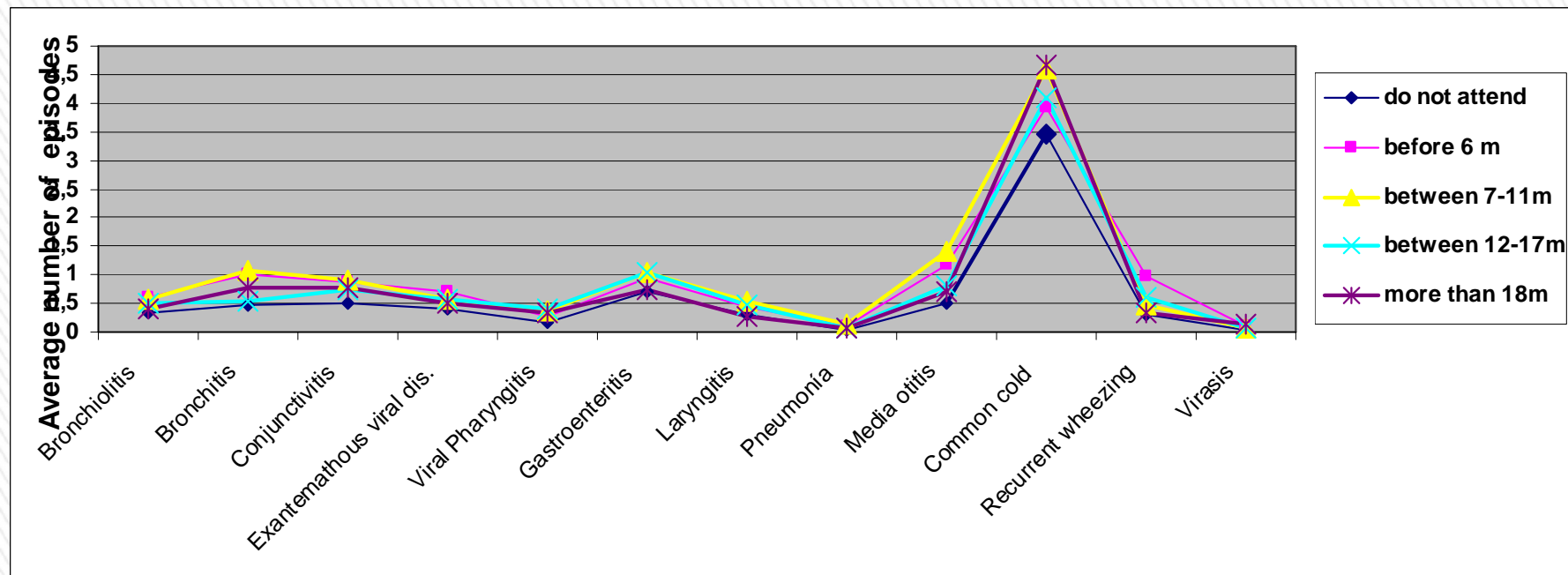
- antes de 6 meses
- entre 7 y 11 meses
- entre 12 y 17 meses
- mas de 18 meses

## Influence of risk factor (exposure time to the nursery) on the average number of episodes of all diseases studied depending on the age of onset

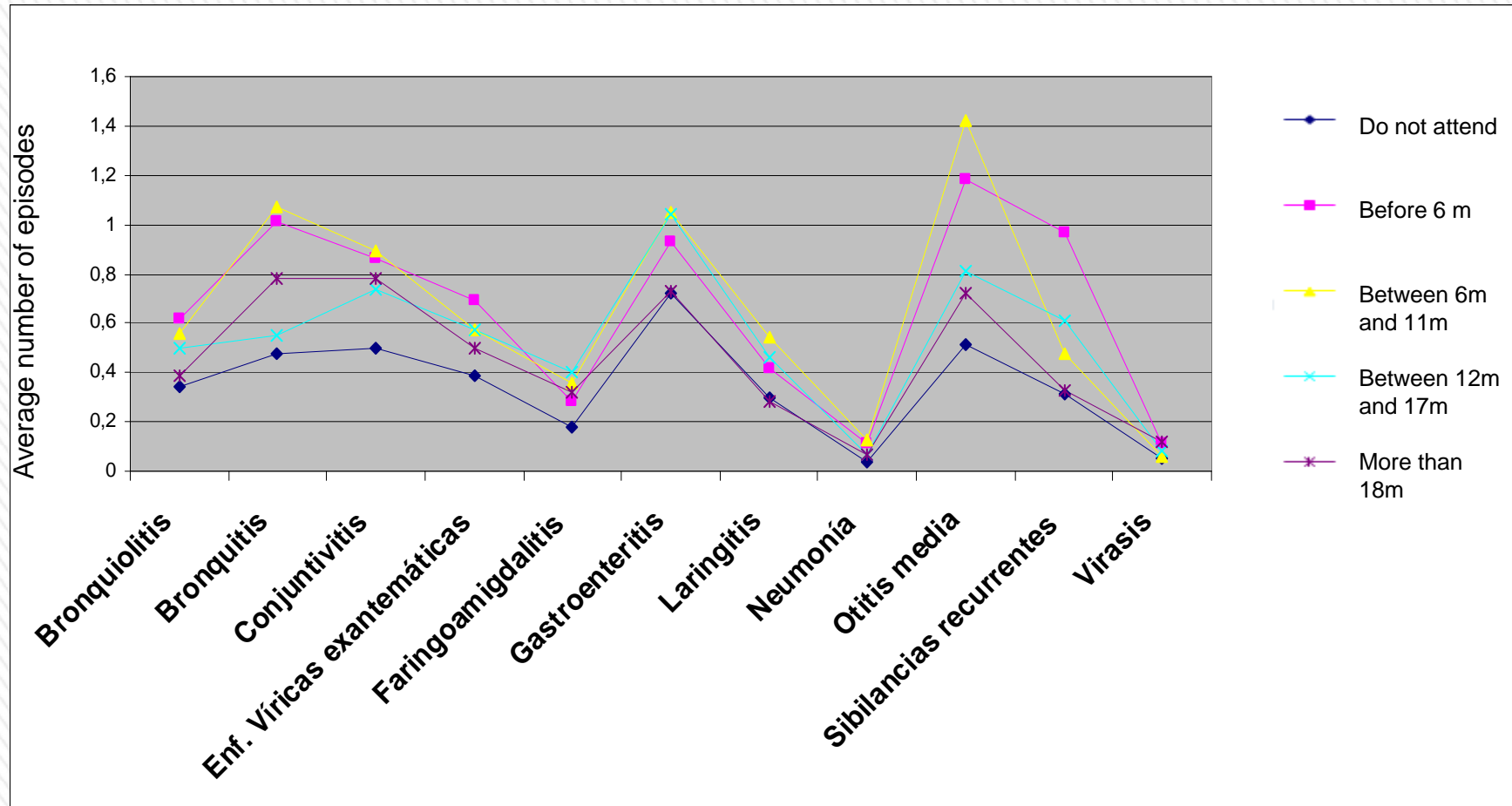


Do not attend daycare Before 6 months 6-11 months 12-17 months More than 18 months

## Influence of risk factor (exposure time to the nursery) on the average number of episodes of all diseases studied



## Influence of risk factor (exposure time to the nursery) on the average number of episodes of all diseases studied



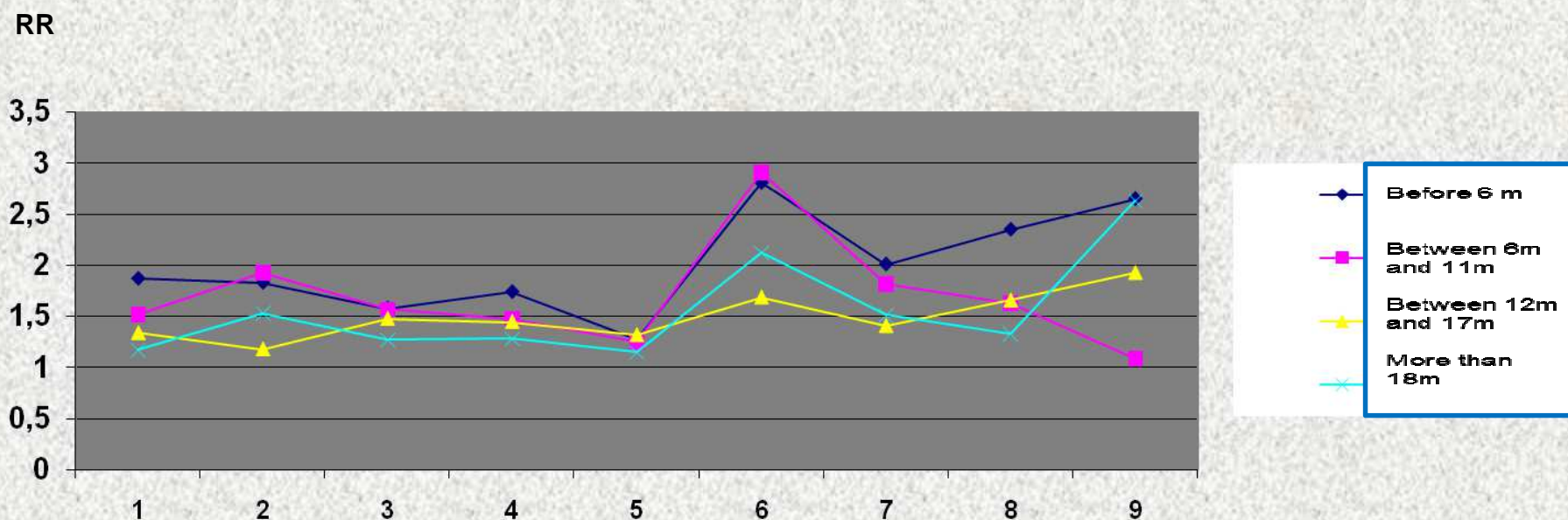


## Influence of risk factor (exposure time to day care) Relative risk to suffer from various pathologies

	RR before 6m (CI)	RR 6 -11 months (CI)	RR 12 -17 months (CI)	RR more than 18 months (CI)
<b>Bronchiolitis</b>	1,87 (1,42-2,47)	1,52 (1,16 2,01)	1,34 (1,02 - 1,75)	1,17 (0,85-1,61)
<b>Bronchitis</b>	1,83 (1,41-2,38)	1,93 (1,55-2,4)	1,18 (0,86-1,55)	1,53 (1,19-1,98)
<b>Conjunctivitis</b>	1,58 ( 1,24-2,03)	1,57 (1,26-1,94)	1,48 (1,2-1,81)	1,27 (0,98-1,62)
<b>Exantemathous viral dis.</b>	1,74 (1,32-2,29)	1,48 (1,14-1,92)	1,45 (1,13-1,85)	1,28(0,96-1,71)
<b>Viral Pharyngitis</b>	0,92 (0,63-1,34)	1,04 (0,78-1,39)	1,18 (0,92-1,52)	1,22(0,93-1,58)
<b>Pharyngotonsillitis</b>	1,27(0,73-2,23)	2,03(1,39-2,96)	2,02 (1,42-2,87)	1,54(1,001-2,37)
<b>Gastroenteritis</b>	1,28(1,03-1,59)	1,25(1,04-1,51)	1,32(1,12-1,56)	1,15(0,94-1,4)
<b>Flu</b>	1,73(0,91-3,29)	1,37(0,75-2,51)	1,28(0,72-2,27)	1,72(0,99-2,97)
<b>Laryngitis</b>	1,3(0,87-1,96)	1,55(1,13-2,12)	1,21(0,87-1,67)	0,9(0,59-1,37)
<b>Pneumonía</b>	2,81(1,22-6,45)	2,91(1,43-5,95)	1,69(0,76-3,79)	2,12(0,95-4,72)
<b>Media Otitis</b>	2,01(1,59-2,53)	1,82(1,47-2,26)	1,41(1,11-1,78)	1,51(1,18-1,93)
<b>Common cold</b>	1,09(1,05-1,13)	1,03(0,98-1,09)	1,01(0,96-1,07)	1,02(0,96-1,08)
<b>Recurrent wheezing</b>	2,35(1,54-3,59)	1,63(1,05-2,52)	1,66(1,12-2,48)	1,33(0,83-2,15)
<b>Sinusitis</b>	1,81(0,91-3,58)	1,46(0,77-2,76)	1,81(1,05-3,09)	1,06(0,51-2,21)
<b>Virasis</b>	2,65(1,23-5,71)	1,09(0,42-2,82)	1,93(0,96-3,86)	2,63(1,25-5,12)

## Influence of risk factor (exposure time to the day attendance) on the relative risk of developing the diseases studied by age of onset

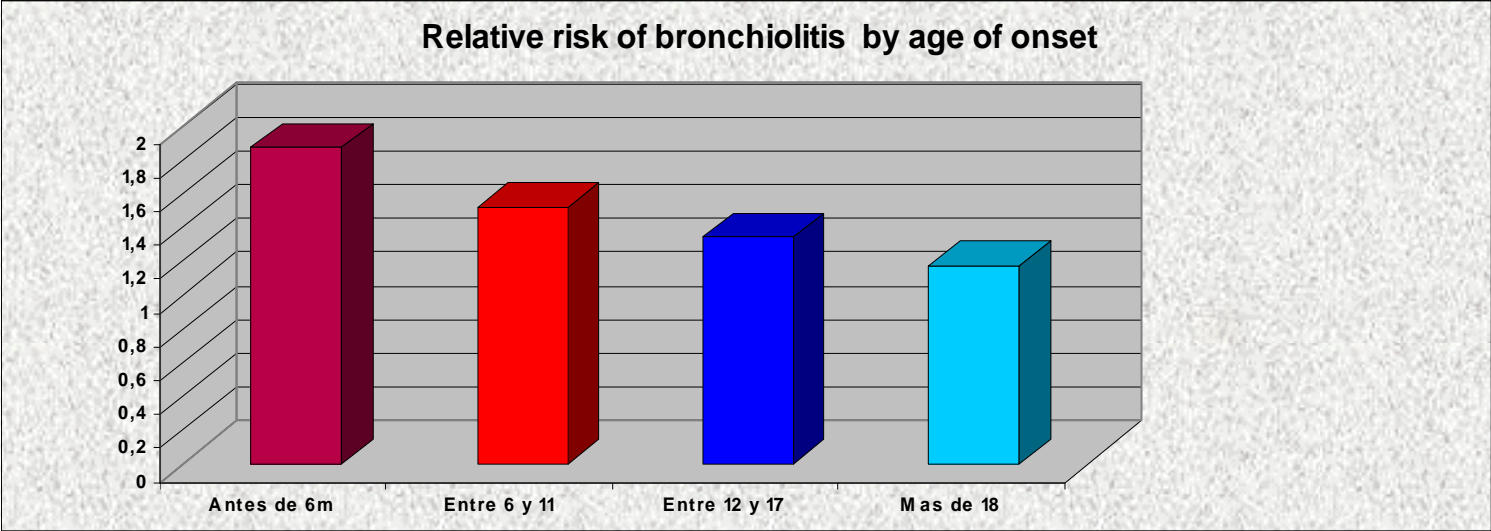
Riesgo relativo de padecer diferentes patologías según edad de inicio a guardería



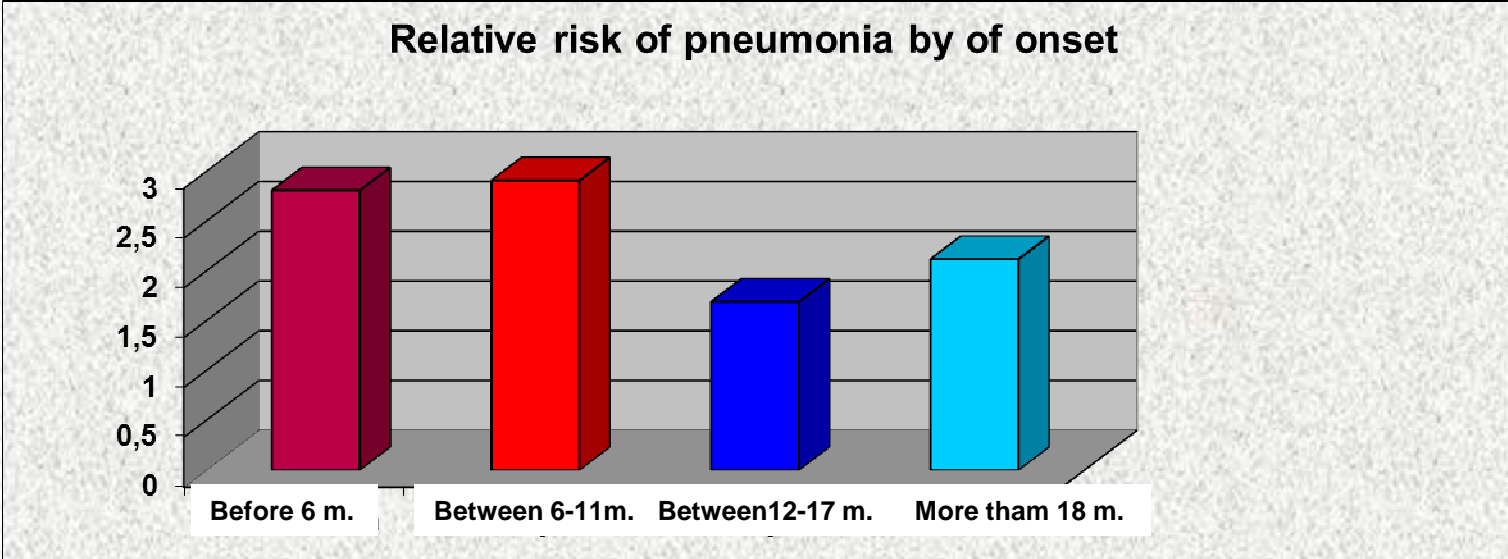
Bronchiolitis
Bronchitis
Conjunctivitis
Exant.viral dis.
Gastroenteritis
Pneumonía
Media Otitis
Recurrent wheez.
Virasis



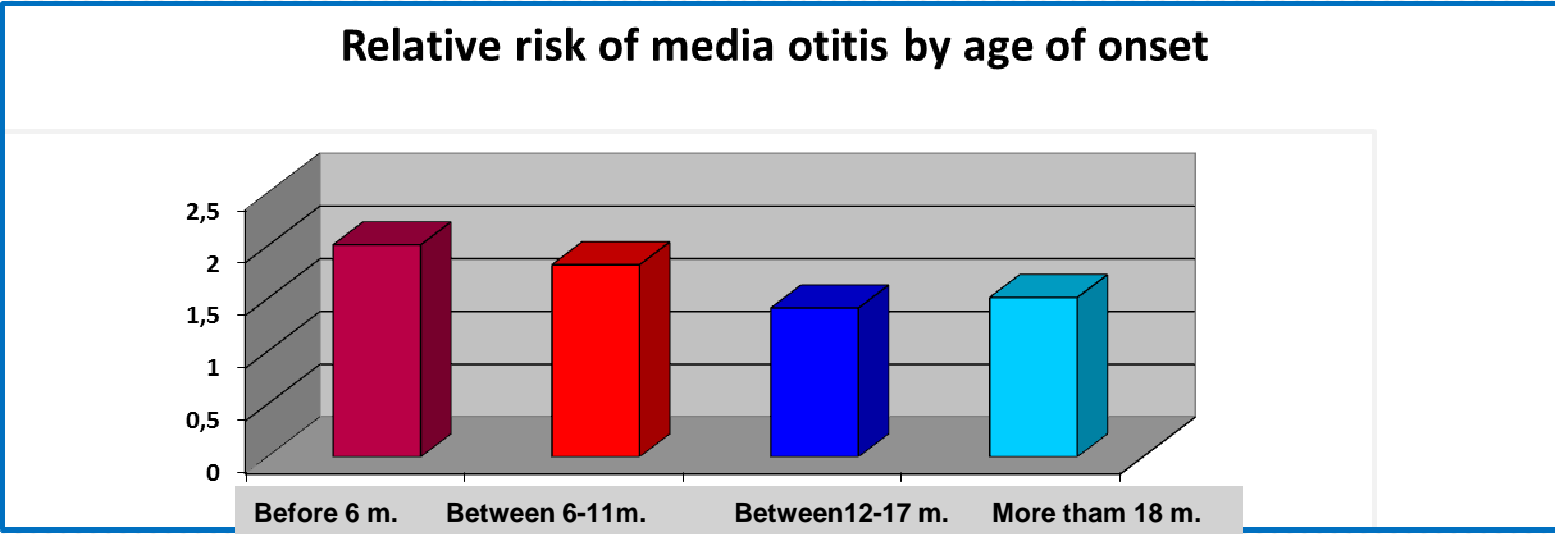
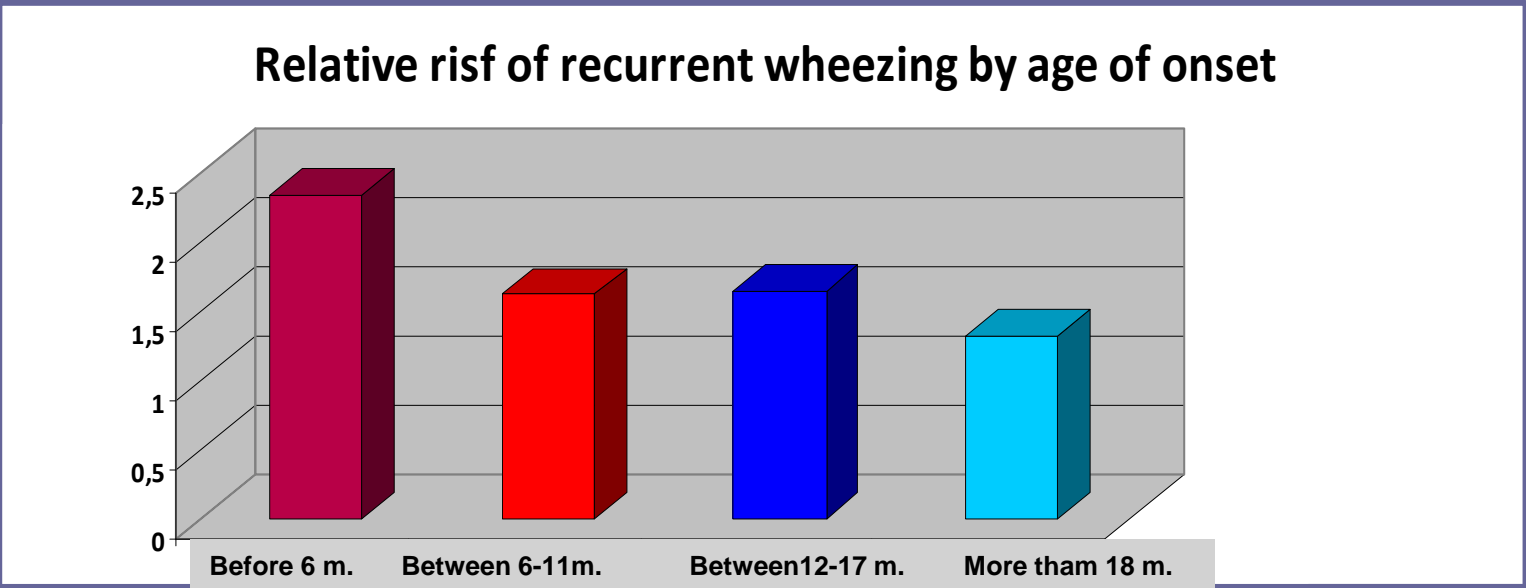
# Relative risk of bronchiolitis and pneumonia by age of onset



Before 6 m. Between 6-11m. Between 12-17 m. More than 18 m.



## Relative risk of recurrent wheezing and otitis media by age of onset



## % Drugs used by children attending/not attending day care

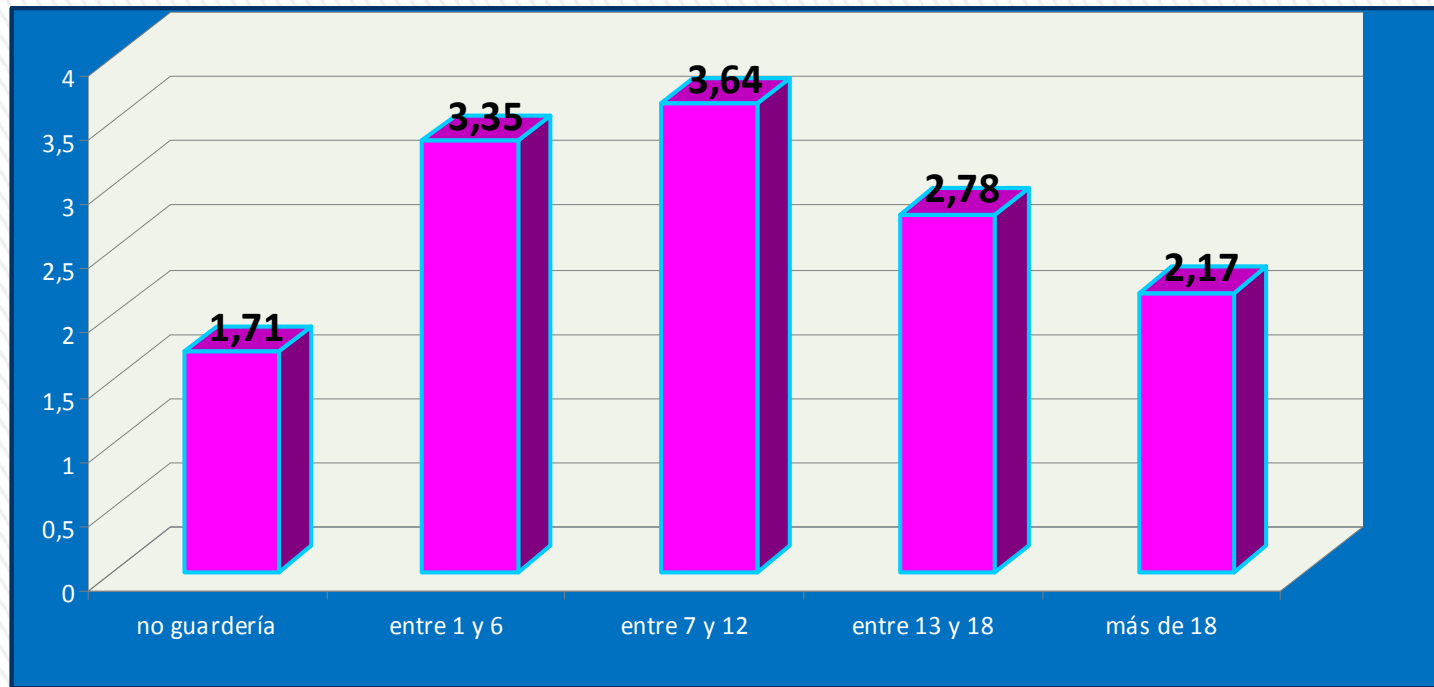
	CHILDREN THAT NOT ATTEND DAY CARE: % DRUGS TAKEN ANY TIME	CHILDREN THAT ATTEND DAY CARE: % DRUGS TAKEN ANY TIME	P VALUE
<b>ANTIBIOTICS</b>	68,12%	84,98%	0,0000
<b>INHALED BRONCHODILATORS</b>	22,77%	40,38%	0,0000
<b>ORAL BRONCHODILATORS</b>	27,87%	38,97%	0,0003
<b>INHALED CORTICOSTEROIDS</b>	9,11%	15,02%	0,0005
<b>ORAL CORTICOSTEROIDS</b>	27,14%	38,97%	0,0001
<b>MONTELUKAST</b>	6,19%	13,85%	0,0000



## % Drugs used: relative risk and confidence interval

	RR	CI-	CI+
ANTIBIOTICS	1,24	1,16	1,34
INHALED BRONCHODILATORS	1,77	1,46	2,15
ORAL BRONCHODILATORS	1,39	1,17	1,67
INHALED CORTICOESTEROIDS	1,65	1,16	2,33
ORAL CORTICOESTEROIDS	1,44	1,19	1,72
MONTELUKAST	2,23	1,49	3,34

## Antibiotics average cycles (less than two years)



No day care att.

1-6 months

7-12 months

13-18 months

More than 18 months



## CONCLUSIONS

- Day care attendance is a risk factor for infectious diseases.
- The earliest onset age of day care attendance, increases the risk
- Some of the pathologies: bronchiolitis, recurrent wheezing, pneumonia and otitis can seriously affect the health of children who suffer them.
- The frequent number of episodes suffered, even banal cases, may affect children development.
- The risk of developing pneumonia, recurrent wheezing, otitis media and viriasis is twice as high for children attending day care.
- Families should have this information
- Society should offer alternatives to improve health in children younger than 2 years old.





## INFLUENCE OF DAY CARE ASSISTANCE ON DISEASE IN CHILDREN FROM CERO TO TWO YEARS

THANK YOU VERY MUCH TO ALL CONTRIBUTORS

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