

Prevention of respiratory tract infections. Situation in 12 private day care centers in the city of Buenos Aires

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ABSTRACT

Introduction. Day care center attendance is a risk factor for acquiring respiratory tract infections. There are preventive measures which should be applied.

Objectives. To describe the availability of adequate supplies or building facilities, staff habits, behaviors and training, and the existence and enforcement of official guidelines or institutional standards regarding the prevention of respiratory tract infections in day care centers for infants in the city of Buenos Aires.

Methods. Exploratory and cross sectional study carried out at systematically selected private day care centers for infants. The person responsible of the day care center was interviewed and a 3-hour observation session was held in a room of each of the day care centers. Information was collected on hand washing practices, clearance of nasal secretions, school exclusion guidance, immunization control, breastfeeding promotion and the existence of guidelines, standards and training on the prevention of respiratory tract infections.

Results. Twelve day care centers were included. Though 8 of the 12 centers had the necessary infrastructure and items, hand washing was uncommon and the technique used was incorrect. Clearance of nasal secretions was not followed by hand washing. At 11 of the 12 day care centers, children's immunization is monitored; at 9 of 12, school exclusion guidelines are not followed; none of the centers have breastfeeding promotion material. In 1 of 12, teachers were trained in the subject the year before and, 1 out of 12 had its own guidelines for infection prevention.

Conclusion. Despite the availability of resources, preventive measures were not regularly and systematically implemented in the day care centers visited.

Key words: day care centers, respiratory tract infections, infection prevention.

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INTRODUCTION

Respiratory tract infections are common during the first two years of life. They are an important cause of hospitalization, after congenital defects and perinatal problems, and the main cause of mortality in children under one year of age.¹⁻⁴

Day care center attendance is a known risk factor for acquiring infections. Its relevance lies on the implications for the child and the spreading of these diseases within the community.^{5,6}

Sociocultural changes resulting from the participation of mothers in the labor market have created the need of having children taken care of out of their homes.⁷⁻⁹

Although there are preventive measures such as hand washing, adequate clearance of nose secretions, exclusion of symptomatic children and adults, or breastfeeding promotion, in our country, as in many others, day care center staff members are not provided with guidelines on this topic.¹⁰ Day care centers' activities in the city of Buenos Aires (CABA) are subject to Act 621, which includes general regulations on health related matters, but, except for the requirement of an designated sink in diaper changing areas or food prep/storage areas, no other prevention measures or procedures are mentioned.¹¹ Therefore, those who are able to implement measures might not be aware of them, not know how to approach it or how to implement these measures.

An exploratory study of the situation at private day care centers in the city of Buenos Aires was conducted.

OBJECTIVES

1. To describe the availability of items, supplies or building facilities which are adequate to prevent the spreading of respiratory tract infections.
2. To describe staff habits, behaviors

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and training as regards the prevention of respiratory tract infections in day care centers for infants.

3. To determine the existence and enforcement of official entities' guidelines or institutional regulations for the prevention of respiratory tract infections.

METHODOLOGY

A descriptive, observational, cross sectional study was conducted in 12 private day care centers in the City of Buenos Aires.

Selection of participating day care centers

The city was divided into 12 geographic areas. A list of day care centers with definitive registration at the Private Management Education Board was obtained.¹² Day care centers were classified per area and ordered alphabetically. Each center was contacted by phone, following the order within each area. A maximum of 3 calls were made, one per week, to each day care center before calling the following in the list. The first center which accepted to participate in each area was visited.

Inclusion criteria were the following:

- The day care center population should include children between 45 days and 2 years old.
- The day care center should be registered in the Registry of Educational and Childcare Institutions of the General Private Management Schools Board and/or Initial Education Department of the city of Buenos Aires.
- The appropriate authority in charge of the day care center should submit a written consent for the study to be conducted.

The fact that a day care center be located within a healthcare institution or run by one was considered as an exclusion criterion, since it might be a probable bias.

During the first visit, the informed consent was obtained from day care center directors. The study was thoroughly explained, questions were answered and then, the informed consent form was signed.

Afterwards, different procedures were carried out:

- a) The person responsible of the day care center (or representative) was subjected to a semi-structured interview.

The data collection form for the interviews was designed by the authors, reviewed by a specialist in qualitative research, and adjusted through pilot interviews with day care center coordinators and directors.

- b) A three-hour observation session held in a room attended by children under two years of age (chosen by the person in charge of the day care center).

Through the interview and the observation session, information was obtained on the following actions (*Annexes 1 and 2*):

- Hand washing practices (staff and children; guidelines established to this end, availability of items and correct development of the procedure).
- Clearance of nasal secretions.
- Hygienic practices (procedure and frequency).
- Changing of diapers (since it is a relevant marker of hygienic practices).
- School exclusion (guidelines established).
- Availability of resources (physical and environmental conditions, etc.).
- Monitoring of staff and children immunization programs.
- Conditions at the institution for breastfeeding promotion.
- Prevention guidelines or standards in place.

All visits were by the authors. A confidential written report addressed to each institution's directors was prepared after each visit, describing the diagnosis of the situation and providing suggestions to implement a corrective action plan. After the interview and the observation session, a workshop on respiratory tract infections prevention was developed with all the staff of each of the day care centers.

The information was entered into a database specifically created for such purpose.

Statistical analysis

A descriptive analysis of registered outcome measures was done. Qualitative outcome measures were analyzed through frequencies and percentages, and quantitative outcome measures, by means of measures of central tendency and scattered plots. Excel 2007 was used.

Regulatory and ethical aspects

This study was reviewed and approved by CEMIC Ethics Committee.

At every participating institution, the informed consent was obtained.

The persons responsible of these day care centers were given access to all documents related to the study to be submitted to relevant authorities. Participating institutions were provided with a reporting form sample addressed

to parents to inform them about the conduction of the study. Data as well as the names of participating institutions were considered confidential. The database was registered at the National Department of Personal Data Protection.

RESULTS

Between May and August, 2013, twelve day care centers were included (*Figure 1*). Seven directors and 5 coordinators were interviewed. The median time day care centers had been operating was of 12.5 (2-48) years. The median number of attending children under two years of age was 26 (16-85). In 4 centers, there were children whose health status increased susceptibility to respiratory tract infections, like premature birth, history of severe pulmonary disease at the time of birth, or heart disease. In 8 day care centers, 23 children had been hospitalized due to respiratory tract infection (median: 2; range: 1-6) in the former year.

Observations were carried out at 1 infant room, 3 infant and toddler rooms, and 8 rooms designated for toddlers. The median number of children per room was 9 (4-12); the median number of teachers, 2 (1-2), and the median of the children/teacher ratio was 5 (3-9).

At every day care center, directors stated that respiratory tract infections were common among children. In 7 out of 12 centers, they said these infections were dangerous only for children with risk factors. When asked about the influenza type A epidemics (2009), at 7 day care centers they

reported having implemented or emphasized the use of alcohol gel as a preventive measure. No changes had been introduced regarding preventive guidelines in the remaining 5 day care centers.

Table 1 shows data about building facilities and equipment in the 12 observed day care centers.

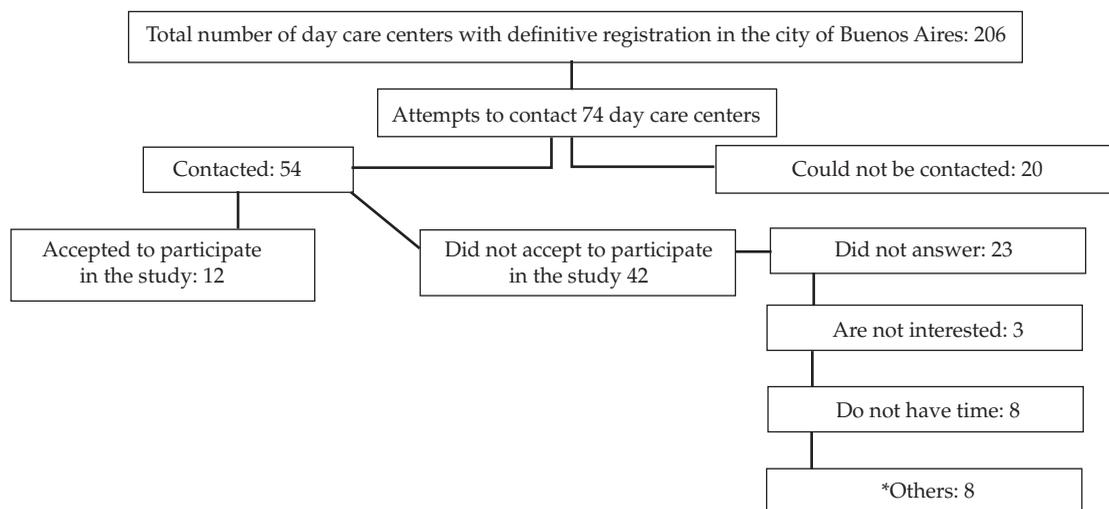
Table 2 shows what has been observed regarding hygiene habits. Hand washing after clearance of nose secretions was almost null. Besides, there were 10 situations in which children showed visible nasal secretions which were not cleaned away. Graphic materials promoting hand washing were not seen at any day care centers. Only in two of the observed centers, adults wore clothes which were exclusively used in the center and, in other two centers, they wore exclusive shoes. In 10 out of 12 centers observed, at least one teacher wore accessories on her hands and/or forearms. Staff training and guidelines were uncommon (*Table 3*).

Use of aerosol disinfectant or aromatizing sprays was admitted or observed at 4 day care centers.

All day care centers that were visited kept children's vaccination records. In 11 out of 12 daycare centers, the vaccination schedule of the staff was monitored, but required vaccines as well as indication criteria used were heterogeneous.

In 8 out of 12 day care centers there were no formal instructions for a teacher to leave a room

FIGURE 1. Flowchart of participating day care centers



* They refuse to participate in the study after having accepted the visit because they fear they would be reported to the authorities and/or they have a different concept about health and illness.

due to health problems. At 9 institutions we were told that most parents took their children to the day care center even if they were ill, and argued they would rather be contacted at their workplaces if the situation got worse instead of staying at home. When asked about health problems about which parents were contacted to take their children back home, in only one day care center breathing difficulty was mentioned. A record of absenteeism for health reasons was kept in 7 out of 12 day care centers; in 8 of them, a medical certificate was required to be able to get back to work after having had a disease or illness.

As regards breastfeeding, in 5 out of 12 day care centers mothers left breast milk for their children; in 3 centers, mothers came to the center to breastfeed their babies, and only one of the day care centers had an area devoted to that specific purpose. Graphic materials promoting breastfeeding were not observed at any day care center.

Three institutions had a health professional as advisor.

DISCUSSION

Despite the fact that many of the institutions had adequate resources, most of the day care

centers visited during this study showed a poor implementation of respiratory tract infection preventive measures.

Hand washing, the most evidenced non-specific prevention measure,¹³⁻¹⁵ and a simple and easy-to-implement procedure, was not implemented in most of the situations which would have required it. Furthermore, the procedure was incorrectly applied in those instances in which hand washing was being performed.

These findings agree with those of a Dutch study which included 122 day care centers,¹⁶ in which overall hand washing compliance was 42%, and with the 16% reported by Barros et al. in Brazil, regarding hand washing practices after diaper changing.¹⁷

Instances of contact with respiratory secretions were not managed as potentially infectious. Even though most of the times disposable tissues were used, which has been associated to a lower risk of infection by respiratory microorganisms like *Haemophilus influenzae*,¹⁸ subsequent hand washing was intermittent among the staff and null among children; this also agrees with Zomer's findings,¹⁶ who confirmed that only in 25% of such situations some type of subsequent hygiene measure was adopted.

TABLE 1. Characteristics of buildings and equipment of day care centers included in the study

Number of day care centers= 12		
Physical plant	YES	Comments
External windows	10	* Despite smoking is forbidden in the center, terraces are used by smokers.
Air conditioning	4	
Combustion heating	0	
Washable floor	9	
Removable carpets	5	
Smoking area*	0	
Hygiene resources	YES	Comments
Sink in the day care center	9	* There are two centers where hand cream is available, without a dose dispenser.
Mono-command tap	4	
Fluid soap	8	** Seven day care centers have trash bins with a lid but without a pedal.
Bar soap	2	
Tissue paper for drying	8	
Alcohol gel dispenser	11	
Hand cream dispenser*	0	
Personal hygiene articles (e.g.: calcium liniment)	2	
Accessible disposable tissues	9	
Gloves	10	
Individual plastic bags for disposable items	4	
Designated feeding and diaper changing areas **	0	
Other resources	YES	Comments
Individual, washable cradles	2	* The use of non-individual mats was observed in 3 day care centers.
Cushions and/or pillows	5	
Individual, washable mats*	4	** In practice, the use is not exclusive.
Designated feeding and diaper changing areas **	10	
Graphic materials on prevention	0	

In most of the day care centers that were visited, the number of children / teacher ratio, a factor associated to a lower rate of hand hygiene,¹⁶ was appropriate and in compliance with Act 621 requirements.

Hygiene and disinfection of the area, an effective measure to reduce microorganism spread,^{19,20} are not systematically carried out. Unawareness and absence of standards might result in the adoption of measures which not only lack a scientific rationale but can also be detrimental, as is the frequent use of aerosol disinfectant sprays.²¹

All the persons interviewed considered these infections were relevant and, in many cases, children had been hospitalized because of them; yet, only in one institution there were standards on preventive measures available. In our country, there is a document available on infection prevention at schools and day care centers which is addressed to health care providers, however, most of the day care centers that were visited do not have a health care provider as advisor.²² Furthermore, in those centers which did have one, the topic did not seem to be considered a priority. The absence of

TABLE 2. Hygienic habits in observed day care centers (n= 12)

Hand hygiene	YES	%	Comments
Graphic materials about the procedure	0	0	* The correct technique was used in only one situation.
Situations that require hygienic practices in adults, n= 31	YES	%	** Alcohol gel was used in one situation.
Hand washing with water*	12	39	*** In the rest of the situations, cloth towels were used or paper towels were reused.
Drying with disposable tissue papers	10	31	
Alcohol gel use	19	61	
Situations that require hygienic practices in children, n= 98	YES	%	
Hand washing with water**	62	63	
Drying with disposable tissue papers ***	47	48	
Cleaning with wet towels	35	36	
Clearance of secretions,* n= 75	YES	%	Comments
With disposable individual tissues	71	95	* Applies to what was observed in situations where children are involved.
With wet towels	2	3	As regards adults,
With the hand	2	3	the situations observed were 3:
Correct disposal of tissues	67	89	1 with tissue and 2 with the forearm.
Operator's hand hygiene	3	4	
Children's hand hygiene	1	1	
Diaper change, n= 85	SÍ	%	Comments
Use of gloves (in both hands)	10	12	
Use of 1 glove (in one hand)	34	40	
Without gloves	41	48	
Immediate disposal in an individual plastic bag	3	4	
Immediate disposal into the trash basket	60	70	
Operator's hand washing	18	21	
Children's hand washing	0	0	
Subsequent cleaning of diaper changing table	41	48	

TABLE 3. Training activities and standardizations in participating day care centers (n= 12)

Specific training for teachers in the past year	1
Organization of training activities for non-teaching staff or parents during the past year	0
Received notes on this topic from health or educational official entities*	4
Has its own written guidelines or regulations on the prevention of respiratory tract infection	1
Has regulations or a written procedure outline on hand hygiene	4
Has written regulations about the building area cleaning	3
Keeps a written record of cleaning compliance	0

* In all four cases, an e-mail including a warning message about the upcoming winter season was sent without any specific recommendations about infection prevention.

specific guidelines on prevention addressed to the staff of day care centers or of recommendations by education or health authorities, as well as the lack of staff training suggest the need for an effective support and supervision for them to be able to implement preventive measures in this setting. Even those situations addressed by Act 621, as the requirement of a medical certificate of be able to go back to work to the day care center after a disease or an illness, or the use of separate areas for eating and change of diapers, are not regularly complied with. In contrast to what happens with the prevention of respiratory tract infections, in the city of Buenos Aires there is a strict and widely enforced standardization of safety matters in educational institutions based on the relevance of unintended injuries in childhood.²³ Given the magnitude of the problem posed by respiratory infections, this matter should also be a priority in the educational-health discussion agenda.

It is worth mentioning the difficulties to prevent parents from leaving their children at day care centers when they are ill, which is in line with Sacks' survey²⁴ administered to 1988 day care center directors in the United States, who stated that the main measure to be improved so as to prevent infectious diseases in their institutions was to get parents to comply with regulations in force. This problem is beyond the institutional scope, since one of the social functions of this educational level is to offer families the possibility of articulating their children's care with their own job duties.²⁵ Thus, the absence of a legal frame to regulate the care provided results in a contradiction between day care centers and their staff's operational capacity and the need to comply with the abovementioned social role when they have to provide care in certain illness situations. This is particularly true for families of a lower socioeconomic level.^{9,25}

Breastfeeding is a protective factor against infections,^{26,27}; its promotion is cheap, and the reception and handling of breast milk by the day care center staff is operatively simple. However, mothers left breast milk or came to the day care center to breastfeed their children in less than half of the day care centers.

Health education in the educational environment is a basic right of all children.²⁸ The information collected during this study does not show that participating day care centers are positioned as health promoting entities, which is consistent with Davó et al.'s findings²⁹ on educational first level educational institutions in Spain. In the past, school health programs

were considered as an exclusive responsibility of the health sector, and educational institutions as passive receivers of such interventions. Nowadays, the Health Promoting Schools Regional Initiative (OPS) considers that health and education professionals can and must be active partners in the promotion of habits and skills to live a healthy life.³⁰

So that educational and childcare institutions are able to carry out their task, an empowerment process is critical, which implies the development of competences and the training of skills.³⁰ This process can only be carried out if the subject matter becomes relevant among decision makers in the educational and childcare setting and this is translated into concrete actions as developing regulatory framework, educating the staff involved and disseminating it to the community in general.

It should be mentioned that, even though systematically selected, the fact that the 12 participating day care centers were privately managed is a limitation of the project, since they cannot be considered as representative for all the day care centers in the city of Buenos Aires. However, there was certainly some homogeneity in findings, even if their willingness to participate can be considered as an indicator of the significance they assigned to this matter.

A possible bias of our study relates to the difficulty in contacting the day care centers directors and, sometimes, in obtaining their consent, either because of their fear of being reported to the authorities or because they were too busy to spare time in an interview. It can be speculated that some day care institutions do not perceive infection prevention as a priority, possibly due to the lack of training opportunities, regulations and health and education authorities' recommendations.

As far as we know, the strength of this project lies on being the first contribution of local data necessary to estimate the size of the problem in our community, and to trigger actions focused on improving the dissemination and implementation of prevention strategies among involved players.

Additional studies are necessary to make assumptions about the general situation of child care centers as regards infection prevention in our setting, as well as to issue evidence-based recommendations and develop training opportunities specifically designed for these institutions' staff.

CONCLUSION

Despite the availability of resources and the

current evidence, the implementation of measures aimed at preventing respiratory tract infections is not regularly and systematically carried out in the day care centers that were visited. ■

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Annex 1.



ID de jardín:

Entrevistador:

PROJECT

**Preventing the spreading of respiratory tract infections at day care centers in the city of Buenos Aires.
Diagnosis of the situation.**

INTERVIEW

A. GENERAL ASPECTS

Interviewed staff:

1. What is your role in the institution? (mark with an "X" the corresponding answer)
Director Coordinator Teacher Teacher's aide Other

Information on day care center:

2. Day care center member of District no.:
3. Management: Public Private
4. How long ago did the rooms for children under two years of age start working?
Years: Months:
5. How many children under two years of age attend the day care center at present?
6. Number of rooms for children under two years of age:

Information on children who attend the day care center (any room/any age):

7. Do you think respiratory tract infections are common at this age?
Yes No
8. You think respiratory tract infections:
a. Are dangerous for any child.
b. Are dangerous for some specific children.
c. Are not dangerous for any child.
9. Does any child with a chronic health problem or special characteristic attend the center?
Yes No Unknown
10. Has any child attending the center or a child of the center staff (even if he/she does not attend the institution) been hospitalized due to a respiratory tract infection this year or in the past year?
Yes How many?
No Unknown

B. TRAINING/REGULATIONS/PREVENTION GUIDELINES

11. This year, have you received any written communication/instruction/recommendation from any education or health institution (for example, Ministry of Health, Government of the City of Buenos Aires, General Direction of Indigenous Education)?
Yes No

Comments:

.....

.....

12. Does your institution have a written document in place on how to prevent respiratory tract infections (proprietary or adapted from other institution)?

Yes No Unknown

Comments:
.....
.....

13. In the last year, did the institution organize any activity (workshop, conference) related to respiratory tract infections?

13.1 With teachers Yes No Unknown

13.2 With non-teaching staff Yes No Unknown

13.3 With parents Yes No Unknown

14. Did the institution implement any change following the influenza type A epidemics?

Yes No

14.1 What change?

15. If a child has respiratory tract infection symptoms (for example, mucus or cough):

What do most parents do in terms of day care attendance?

a. Most parents bring their child to the center anyway.

b. Most parents do not bring their child to the center.

Comments:
.....
.....

16. If a child has respiratory tract infection symptoms (for example, mucus or cough): What is the center's policy in terms of day care attendance?

Receiving the child (as usual).

Not receiving the child based on a written/established regulation.

Not receiving the child, even though there is no written regulation in place.

Comments:
.....
.....

17. If a child had a respiratory tract infection, such as pneumonia, bronchiolitis or bronchospasm: Do you request a medical certificate to allow the child to attend the center again?

Yes Always Or sometimes: In what situation?:.....

No

18. In what situations do you call and ask parents to withdraw their child from the center?

.....
.....

19. Does the institution have a formal record of child absenteeism for health reasons?

Yes No Unknown

20. Does the institution have formal instructions on when to prevent a teacher from accessing her job?

.....
.....

C. HAND WASHING

21. Does the institution have any written regulation on when teachers should wash their hands?

Yes No

22. Does the institution have any written regulation on when non-teaching staff should wash their hands?
Yes No

23. Does the institution have any written regulation on when children under two years of age should wash their hands?
Yes No

D. IMMUNIZATIONS/HEALTH CHECK-UPS

24. Does the institution follow regulations related to controlling the children's immunization schedules?
Yes No

Comments:
.....
.....

25. Does the institution follow regulations related to controlling the immunization schedules of day care center staff?
Yes No

Comments:
.....
.....

E. BREASTFEEDING

26. Does any mother leave breast milk to feed her child?

Yes How many mothers?
No Unknown

27. Does any mother come to the center to breastfeed her child?

Yes No Unknown

F. INFRASTRUCTURE/CLEANING

28. Does the institution have a smoking area?

Yes No Unknown

29. Does the institution have a pediatrician, nurse or any other health care professional acting as health advisor?

Yes No Unknown

At the institution

On call

Occasional (outpatient visits)

30. How is the cleaning of the place organized?

a. Written instructions Yes No Unknown

b. Written record Yes No Unknown

31. Individual cradle bedclothes

Yes No

32. Where are blankets, bed covers and baby carrier cases washed?

.....
.....

33. How often are these items washed?

.....
.....

34. How are toys cleaned?

.....
.....

35. Would you like to make any comment?

.....
.....

Annex 2.



ID de jardín:

Entrevistador:

Preventing the spreading of respiratory tract infections at day care centers in the city of Buenos Aires. Diagnosis of the situation.

OBSERVATION GUIDELINE

A. ROOM INFRASTRUCTURE AND RESOURCES

Room no.:

1. Number of children present in the room:

2. Age of children: Infants Toddlers

3. Number of teachers and teacher's aides present in the room:

4. Number of windows:

5. Number of fixed windows:

6. Air conditioning:
Yes No

7. Type of heating system:
Electrical Gas Combustion Air conditioning

8. Floor:
Washable (ceramic tiles, concrete, linoleum, laminated, etc.)
Parquet or pinewood (waxed)
Patio tiles (cleaned with kerosene)
Carpet
Other:.....

9. Presence of removable carpets:
Yes No

10. Sink for use by the room:
In the room Next to the room Other place in the day care center

11. Type of faucet:
Mixing faucet Hand-operated

12. Hand washing items:
Liquid soap
Bar soap
Antibacterial soap
Other

Specify:.....

13. Drying items:

- Individual paper towels
Kitchen roll towels
Cloth towels
Electrical hand-dryer

14. Alcohol gel dispenser:

- Yes No
How many? Where?

15. Hand cream:

- Yes Dispenser? Yes No
No

16. Trashbin:

- With lid Yes No
Pedal Yes No

17. Type of cradle:

- Acrylic Chromed Wooden Metal Portacrib Other

18. Number of cradles:

19. Are there pillows?

- Yes No
Individual Yes No
Washable Yes No

20. Are there cushions?

- Yes No
Individual Yes No
Washable Yes No

21. Are there mats?

- Yes No
Individual Yes No
Washable Yes No

22. Are there designated areas for

- Diaper changing Feeding

23. Hygiene articles (calcium liniment, wipes, etc.)

- Individual Yes No

24. Are there paper handkerchiefs which are easily-accessible or at sight?

- Yes No

25. Are there gloves?

- Yes No

26. Are there plastic bags?

- Yes No

B.c. Clearance of secretions

Observation	Secretion handling				Time	Disposed of at	Comment
	Cold	Cough	Secretions	Hygiene			
1							
2							
3							
4							
5							
6							
7							
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31							
32							
33							
34							
35							

C. BREASTFEEDING

69. Is there visible dissemination or advertising to promote and/or support breastfeeding?

Yes No

70. Is there a designated area for breastfeeding?

Yes No

71. Is there any mother breastfeeding at the moment?

Yes No

