

Bandim Health Project: Registration of childhood interventions in rural areas of Guinea-Bissau:

Bandim Health Project (BHP) has cluster samples of women of fertile age and their prospectively registered children in all 9 health regions of Guinea-Bissau. A total of 182 clusters are included in the study. The first 100 clusters in the 5 most populous regions of Guinea-Bissau have been followed since 1990 (1). The remaining clusters were added in 2006.

Since the start in 1990 the clusters have been visited every sixth month to identify new pregnancies and to assess the situation of all children under 5 years of age and of all women of fertile age.

Since 2012 the clusters in three regions are visited every month and vaccines are provided to all eligible infants and some children are enrolled in a trial of early measles vaccination.

The current system has been set up to measure both health outcomes and exposures from health interventions:

Outcomes:

- Mortality
- Morbidity (consultations, hospitalisations)
- Growth (mid-upper arm-circumference (MUAC))

Exposures:

- Vaccinations
- Micronutrient supplementation (Vitamin A)
- Breastfeeding
- Bed net use
- De-worming
- Others (socio-economic conditions, hygienic conditions)

Other exposures might be relevant elsewhere, e.g. IPTi, other micronutrients, and nutritional intervention programmes, but are not relevant at the moment in Guinea-Bissau.

Demographic surveillance and pregnancy registration

The basis for the demographic surveillance system is the registration of pregnancies. Without registration of pregnancies it would not be possible to get accurate information on peri-natal and early child mortality since women are unlikely to report deaths if the pregnancy was not known prior to the event. At each visit in the village, women of fertile age from each compound are asked about new pregnancies and the list of registered pregnancies from the last visit is examined to determine whether the woman is still pregnant or has delivered (list not shown here – see Ex 3 from urban Bissau for a similar list).

Data collection: Child data and interventions

All children who enter the study following a pregnancy registration or because they move to one of the registered compounds before 5 years of age are given a child form (Ficha crianca – see Appendix A). At the time of registration, the child is given a **registration date** which defines its first presence in any survival analysis. Hence, children registered during pregnancy can be counted from

birth but a child who is registered when it is 3 months old can only be counted from that age (registration date) even though the mother may have been registered prior to delivery of the child.

The child form (Appendix A) used at registration has different sections for status and exposure information (figure 1), vaccination information (figure 2) and socio-economic information (figure 3). As described below a separate form (figure 4) is used at subsequent visits to update the status, exposure and vaccination information. The socio-economic information is only collected at first visit (registration).

Figure 1: Status information at first visit

Primeiro Visita depois de Parto Nado Vivo [] Nado morto [] Nasceu gémeo? S [] N [] Aborto [] com quantos meses : _____

Assistente + Data	Presente		Cartão	Com Sup. (se sim: data)	Par. Mamar (se sim: data)	Dormiu ontem na Tenda/Tempo	Tem porco		Mora c. Mãe	Hosp? (se sim: data / idade)	Braço	Cic. BCG Vert/Horz
	Cri	Mãe					Casa	Mor				

Códigos: P=Pres./A=Aus./V=Viagem/H=Hosp/NS=Não sabe; Com.sup: S/N/NS; Quantos Hospitalizações: 0-98/NS; Tenda: Impregnada=TI, Não impregnada=TS, Não dormiu=Não; Todo ano=TA, Chuva=CH;

The questions above the grid: First visit after birth: Result of the pregnancy: Nado Vivo (Live birth) Nado morto (Still birth) Nasceu gémeo? (Born as twins) Y/N Aborto (abortion) com quantos meses (how many months of gestation)_____

The following information is collected at the child registration form and at all subsequent visits:

Column 1: Name of field worker and date of interview;

Column 2: Presente criança + mae. (Presence of Child and mother); Codes: P=Present, A=Absent, V=Viagem (travelling), H=hospitalised, NS=Não sabe=don't know

Column 3: Cartão de Vacina – Vaccination card. VC: Vi cartão (seen card), NVC: Nao vi cartão = card not seen (but has card); CP: Cartão perdeu= card lost; NTN: Nunca tinha cartão – e nunca tomou vacinas (Never had a card – and never vaccinated); NTS: Nunca tinha cartão – mas tomou vacinas (Never had a card – but vaccinated); NS: Nao sabe se tem cartão (Don't know). **Please note that if the vaccination card was seen (VC), the date of interview (column 1) is the date from which vaccination information is known and which can be used in survival analysis of the impact of vaccinations.**

Column 4+5: Nutrition:

- Co Su: Date when started supplementary feeding. Unknown date but started: “S” Not introduced: “N” Unknown: “NS”
- Pa Ma: Date when stopped breastfeeding. Unknown date but stopped: “S” Still breastfeed: “N” Unknown: “NS”

Column 6: Tenda = Bed net: On (Ontem=Yesterday) slept below a bed net last night (Y,N,DontKnow=DK)

Tp: Tempo = Time/Season: TA (Todo Ano –All year) / CH (Chuva – Only Rainy season)

Column 7: Tem porco (has pigs): Ca: Casa = household (Y,N,DK) Mo: Moranca = compound (Y,N,DK)

Column 8: Mo c. Ma:=Mora com Mae – Lives with the mother: Yes/No/don't know. If the child does not live with mother, the time and cause of separation should be recorded (see below).

Column 9: Hosp: Hospitalisada: Y,N,DK – Hospitalised if yes a special hospitalisation form should be completed (Appendix B – which has information on when and where the hospitalisation took place; was it the closest hospital and reason for preferring a specific hospital; whether documentation for the hospitalisation was seen; duration of the hospitalisation; who decided to take the child to hospital; cause of hospitalisation; was it trauma or accident).

Column 10: Arm-circumference (mm) – measured with an insertion tape.

Column 11: Presence of BCG scar (Y/N/evolving); if yes – two cross-cutting diameters (mm)

Figure 2. Vaccination information

BCG : ___/___/___ Pólio ao nasc : ___/___/___

Polio : 1 ___/___/___ 2 ___/___/___ 3 ___/___/___ Ref : ___/___/___

Tripla : 1 ___/___/___ 2 ___/___/___ 3 ___/___/___ Ref : ___/___/___

Penta : 1 ___/___/___ 2 ___/___/___ 3 ___/___/___

Sarampo : 1 : ___/___/___ 2 : ___/___/___ Febre amarela : ___/___/___

Outras Vacinas : _____ : ___/___/___ _____ : ___/___/___

If the vaccination card is seen the vaccines mentioned are filled in with dates for: BCG; OPV0 (OPV at birth); OPV 1-4; DTP 1-4; Penta 1-3; Measles vaccine 1-2; yellow fever; Other vaccines). If the child has no card (NTS) the mother is interviewed about which vaccine the child has received and these vaccines are marked as X/X/X on the form. This information is fairly accurate because different vaccines are given at different places which the mother can easily distinguish (2); BCG in upper left arm, OPV in the mouth, DTP/Penta in the thigh, measles vaccine on the back side of the shoulder, and yellow fever in the upper right arm. Such information can be used to calculate coverage but not sequence or combination of vaccinations since there are no dates.

Socioeconomic indicators registered at the date of first visit (registration). The housing questions are based on previous studies showing these factors to be important for child survival (3). The questions focus on the quality of the house and on household possessions:

Figure 3: Socio-economic information.

Socio economico: Tecto: Palha[] Zinco[] Telha[] Fibra cimento[]
 Casa de banho: Nada[] Latrina[] Dentro[]
 Tem: Telemovel S[] N[] NS[] Radio S[] N[] NS[]
 Gerador S[] N[] NS[]

(Line 1: Type of roof: Straw [] Zinc [] Tiles [] Cement fibres []
 Line 2: Bathroom: None [] Latrine [] Inside house[]
 Line 3: Household possessions: Mobile phone Y[] N[] Unknown[] (belonging to one of the parents)
 Radio Y[] N[] Unknown[] (belonging to one of the parents)
 Line 4: Generator Y[] N[] Unknown[] (in the household))

Figure 4: Child list for updating information on already registered children

Prior to a visit to a district/region a child list is printed with all registered children and pregnancies including the information already collected (Column 1-4). Some fictive examples are given in Appendix C.

Figure 4: Child list - codes

1: 2: 3: 4: 5: 6: 7:8: 9-12: 13-16: 17-19:20-22 23: 24: 25:26 27 28

Noc	Nome da Criança	Sex D.Nasci.	Pres.	Crt	Vacinas:							Ali:	Tenda	Tem	Mo	Ho	Exame	
Mor Mul	Nome da Mãe	Gem D.Regis.	Cr	Ma	BC P	Polio:	Tripla	Pentaval	Saram	Fe	Co Pa	Co	Pa	Ca	Mo	Ca	sp	
ID		Codesai Estudo			G Na	1 2 3 4.	1 2 3 4	1 2 3	1 2	Am	Su Ma	ON	TP	Ca	Mo	Ma		
684	NAME OF CHILD	2 15/08/2011			15	19 11 22		19 11 22			1						Braco:	
15 18	NAME OF MIF	2 08/05/2011			8	9 11 12		9 11 12			1						Cic.BCG:	
3200684	ID mae: 32015018	1 0			11	** 11 11 11	**	** ** ** ** **	**	**	55 00						OBS MVEPI	
			Mandado vac:				Porque nao mandado: Intervalo curto >12 mes											
Ultimo campanha: 1203 C. seguir:codigo: _____ Part: _____ Data: / / _____ Crt. Inf: OBS _____ C. seguir:codigo: _____ Part: _____ Crt: _____ Inf: OBS _____																		
Ultimo hosp: / / Hosp seguir:S: _____ N() NS() Hosp seg.2: / / _____ Fichas feito: Hosp_Fal: _____ MVEPI: _____ 2-Dose: _____																		
Sep. de mae: / / Causa: _____ A crianca mudou / / _____ Para onde: _____ A crianca faleceu: / / _____ Causa: _____																		

- Column 1: NOC: Numero de Crianca (Child number) (4-digits)
- MOR: Numero de Moranca (Compound number)) (2 digits)
- MUL: Numero de Mulher (Number of women of fertile age (WFA)) (3-digits)
- ID: ID de crianca (Child id – is based on number of region + village number + child number; so the child listed (ID=3200684) is Region 3+village 20+child number 684)

- Column 2: Nome de crianca (Name of child)
- Nome de mae (Name of mother)
- ID mae (ID of the mother)

- Column 3: Sex (1: Macho, 2 Femea)
- Gemeo=twins (1: Sim=Yes, 2 Nao=No)
- Codesai (=exit status: 1: still part of the study)

- Column 4 Dia de nascimento (Date of birth)
- Dia de registo (**Registration date**)
- Estudo: Study number if included in a trial

Columns 5-28 are used to collect the same information / update the information from the previous visit/registration visit.

- Comum 5: Child and maternal presence at visit
- Column 6: Cartão de Vacina – Seen vaccination card.
- Columns 7-22 have pre-printed vaccines already registered for the child. During these visits the information on vaccines is verified and new vaccines are added. All vaccines in the routine vaccination programme are on the list:
- Column 7: BCG
- Column 8: Polio at birth (OPV0)
- Column 9-12: OPV 1-4
- Column 13-16 Tripla=DTP (given in the EPI program until 2008)
- Column 17-19: Pentavalent vaccine
- Column 20-21: Measles vaccine 1-2
- Column 22: Yellow fever

- Column 23: Nutrition: supplementary feeding and weaning

Column 24: Bed net
 Column 25: Pigs in household or compound
 Column 26: Mo c. Ma=Residence with the mother
 Column 27: Hospitalisation
 Column 28: Exame: Braco=Arm-circumference (MUAC); Cic BCG=BCG scar: Yes/ E (evolving)/No; Measurement of size of BCG scar

Line 1 below: Ultimo campanha=Last campaign, i.e. the most recent campaign registered for the child. Each campaign is assigned a code depending on year and month when it took place; for example, 0907 for July 2009 when there was a general measles campaign in Guinea-Bissau. The information is recorded as:

Código ____ Part.: __ Data ___/___/___ Inf. no cartão: __ Informador: ____

(Code, Part=Participation yes/no/don't know, Inf no cartao=Information on vaccination card: yes/no/don't know, Informador=Informant: mother=1, other)

Line 2 below: pre-printed Date of last registered hospitalisation. Field worker (FW) has to fill in any subsequent hospitalisations; FW has to mark that a questionnaire has been completed. In the example (Fígure 4) the last campaign was 1203=March 2012.

Line 3 below: Separation from the mother. When. Cause

Exit from study: Date of moving + to where / date of death + cause

We have previously asked about the two most common vaccine preventable infections – i.e. measles and whooping cough. However, they have become so rare that mothers do no long recognise the infections and we may therefore produce more confusion by asking about these infections as if they should have had them. In case of epidemics the question will be reintroduced.

Campaigns

The FW has to register for all campaigns whether the child took part in the campaign. It is pre-printed on the form which is the last one registered (in Figure 4 it is 1203=March 2012). The FW then has to complete information for all subsequent campaigns. To facilitate this work the FW should be familiar with all the campaigns which have taken place - see figure 5 for a list of the possible campaigns.

Figure 5: List of campaigns: Interior of Guinea-Bissau 2009 – 2012

Código	Data	Intervenção
2009		
0901:	7-11 Janeiro 2009	Vitamina A + Mebendazol + Iodo
0907	3-7 Julho 2009	Vitamina A + Mebendazol + Measles vaccine
2010		
1001	19-23 Janeiro 2010	Vitamina A + Mebendazol
1003	6-9 Marco 2010	Vacina Polio Oral (pinta unha) – OPV (nail painted to document reception of OPV)
1004	23-26 Abril	Vacina Polio Oral (pinta unha) – OPV (nail painted)
1005	28-31 Maio	Vitamina A + Mebendazol + Polio

1010	Medio Outubro	Grippe-H1N1 (children 6 months -5 years, pregnant women)
1012	16-20 Dezembro	Vitamina A + Mebendazol
2011		
1103	25-29 Marco 2011	Vacina Polio Oral (pinta unha) – OPV (nail painted)
1104	29 Abril – 5 Maio 2011	Vitamina A + Mebendazol + Polio(pinta unha) – OPV (nail painted)
1111	25-29 Novembro	Vitamina A + Mebendazol + Polio(pinta unha) - – OPV (nail painted)
2012		
1203	23-26 Marco 2012	Vacina Polio Oral (pinta unha) - – OPV (nail painted)
1207	12-15 Julho 2012	Vitamina A + Mebendazol

Campaigns and hospitalizations are registered if they occur after the *date of registration*. Hence, a child which was registered as a pregnancy in January, born in February and examined for the first time in July will have information on campaigns and hospitalisations which took place after the date of birth – whereas a child who was born in January but only registered in July will not have all hospitalisations and campaigns between January and July registered.

Reference

1. Kristensen I, Aaby P, Jensen H. Routine vaccinations and child survival: follow up study in Guinea-Bissau, West Africa. *BMJ* 2000;321:1435-8; Aaby P, Jensen H. Routine vaccinations and child survival: effect of gender. *BMJ* 13 Dec 2002; bmj.com/cgi/eletters/321/7274/1435#27803
2. Aaby P, Martins C, Balé C, Lisse I. Assessing measles vaccination coverage by maternal recall in Guinea-Bissau. *Lancet* 1998;352:1229
3. Aaby P, Jensen H, et al. Crowding and Health in Low-Income Settlements. Case Study Report, Bissau. Copenhagen: Cowi, 1995

Appendix A: Child form

Ficha de Criança

Registrada depois de nascimento : S []

Data: ___/___/___

Nome da criança: _____ Sexo : M [] F [] Nascimento da Criança : ___/___/___ Certo S [] N []

Região: _____ Tabanca: _____ No ___ Criança No _____ (Am no ___) Se nao: O que aconteceu mesmo dia/X dias antes/depois:

Moranca: _____ No ___ Mãe _____ No _____

Visitas antes de Parto:

Assistente + Data:

Primeiro Visita depois de Parto Nado Vivo [] Nado morto [] Nasceu gémeo? S [] N [] Aborto [] com quantos meses : _____

Assistente + Data	Presente		Cartão	Com Sup. (se sim: data)	Par. Mamar (se sim: data)	Dormiu ontem na Tenda/Tempo	Tem porco		Mora c. Mãe	Hosp? (se sim: data / idade)	Braço	Cic. BCG Vert/Horz
	Cri	Mãe					Casa	Mor				

Códigos: P=Pres./A=Aus./V=Viagem/H=Hosp/NS=Não sabe; Com.sup: S/N/NS; Quantos Hospitalizações: 0-98/NS; Tenda: Impregnada=TI, Não impregnada=TS, Não dormiu=Não; Todo ano=TA, Chuva=CH;

Idade de separação de Mãe : Data : ___/___/___ Anos Meses Causa de Sep.:

Vacinas

BCG : ___/___/___ Pólio ao nasc : ___/___/___

Polio: 1 ___/___/___ 2 ___/___/___ 3 ___/___/___ Ref: ___/___/___

Tripla: 1 ___/___/___ 2 ___/___/___ 3 ___/___/___ Ref: ___/___/___

Penta: 1 ___/___/___ 2 ___/___/___ 3 ___/___/___

Sarampo : 1 : ___/___/___ 2 : ___/___/___ Febre amarela : ___/___/___

Outras Vacinas : _____; ___/___/___ _____; ___/___/___

Socio economico: Tecto: Palha [] Zinco [] Telha [] Fibra cimento []
 Casa de banho: Nada [] Latrina [] Dentro []
 Tem: Telemovel S [] N [] NS [] Radio S [] N [] NS []
 Gerador S [] N [] NS []

Campanhas: Código: mês ano; Part./Inf. no cartão: S/N/NS Informador: Mãe (M), Outro (O)

Codigo	Part.	Data	Crt.	Inf.	Obs

Saida de estudo: A Criança mudou : ___/___/___ Para onde : _____ Criança Faleceu : ___/___/___ Causa de Falec : _____

Appendix B. Hospitalisation questionnaire

Ficha de Hospitalização e Autopsia Verbal Ficha Hosp _VA version 4, 26-07-2012

Região _____ no _____ Tabanca _____ no _____
 Morança _____ no _____ Nome da mãe _____ no _____
 Nome da criança _____ no _____ Data de nascimento ____/____/____
 Data de entrevista: ____/____/____ Nome do entrevistador: _____

Tipo de entrevistado: **Que passou com a criança?**
 - Mãe..... - Internou..... → Faça secção 1
 - Outro de casa..... Quem _____ - Faleceu..... → Faça secção 2+(3)+4+5
 - Outro fora de casa..... - Internou e faleceu.. → Faça secção 1+2+(3) +4+5
 - Entrevista não possível. → Porque? _____ - Nado morto..... → Faça secção 2

1	Data de internamento: ____/____/____ Onde internou: _____	
1	Este é o hospital mais perto? - Sim..... <input type="checkbox"/> - Não..... <input type="checkbox"/> → Porque internou aqui? _____ - Não sabe. <input type="checkbox"/>	
1	Viu documentação de _____ data de internamento? - Sim <input type="checkbox"/> → Qual documentação? _____ - Não <input type="checkbox"/>	
1	A criança ainda está internado? - Sim..... <input type="checkbox"/> - Não..... <input type="checkbox"/> → Duração de internamento: _____ - Não sabe. <input type="checkbox"/>	
1	Quem decidiu levar a criança ao hospital? (marque um ou mais) - Mãe..... <input type="checkbox"/> - Pai..... <input type="checkbox"/> - Outro..... <input type="checkbox"/> → Quem? _____	
	Causa de hospitalização: _____	Era trauma/accidente? - Sim..... <input type="checkbox"/> - Não..... <input type="checkbox"/> - Não sabe. <input type="checkbox"/>

