Supplementary Table 1 Sensitivity analyses of non-imputed data (complete case analysis)

Predictors	Virological suppression [Interval]		Virological suppression [Midpo	
	Univariable model HR [95% CI]; P-value	**Multivariable model* aHR [95% CI]; P-value**	**Univariable model HR [95% CI]; P-value**	**Multivariabl model* aHR [95% C P-value**
At cART initiation				
Age (per month older)	0.83 [0.77–0.88]; <0.001	0.86 [0.78–0.94]; 0.001	0.80 [0.75–0.86]; <0.001	0.83 [0.74–0.9 0.001
CD4% (per 10% higher)	1.19 [1.10–1.28]; <0.001	1.13 [1.03–1.24]; 0.008	1.20 [1.11–1.29]; <0.001	1.11 [1.01–1.2 0.033
CD4 count (per 500 cell higher)	1.14 [1.08–1.20]; <0.001	---	1.13 [1.07–1.18]; <0.001	---
Viral load (per $\log_{10}$ higher)	0.79 [0.73–0.86]; <0.001	0.83 [0.76–0.92]; <0.001	0.75 [0.70–0.81]; <0.001	0.71 [0.64–0.7 <0.001
Gender (Ref: Male)				
Female	1.03 [0.83–1.27]; 0.810		1.04 [0.85–1.28]; 0.679	
Infant PMTCT (Ref: No)				
Yes	1.16 [0.91–1.47]; 0.221		1.19 [0.94–1.50]; 0.141	
Maternal PMTCT (Ref: No)				
Yes	1.19 [0.94–1.51]; 0.145		1.29 [1.03–1.62]; 0.028	---
Birth abroad (Ref: No)				
Yes	0.99 [0.70–1.40]; 0.968		0.97 [0.70–1.36]; 0.874	
Year of birth (Ref: <2000)				
≥2000	1.44 [0.93–2.24]; 0.106	---	1.46 [0.94–2.27]; 0.088	---
CDC C event by cART initiation (Ref: No)				
Yes	0.81 [0.61–1.08]; 0.151		0.75 [0.56–1.00]; 0.046	---
Year of cART initiation (Ref: 1998-<2004)				
2004-<2008	0.95 [0.73–1.24]; 0.695	---	0.95 [0.73–1.23]; 0.693	
≥2008	1.27 [0.98–1.65]; 0.073	---	1.02 [0.79–1.31]; 0.884	
Initial ART regimen (Ref: bPI+NRTI)				
NNRTI+2NRTI	0.95 [0.75–1.21]; 0.696	0.74 [0.54–1.01]; 0.060	1.05 [0.84–1.32]; 0.677	1.02 [0.71–1.4 0.932
NNRTI+3NRTI	1.04 [0.78–1.39];	0.84 [0.53–1.33];	1.24 [0.94–1.64];	0.93 [0.56–1.3

	0.780	0.455	0.122	0.783
Ethnicity (Ref: Black)				
White	0.86 [0.66–1.11]; 0.246		0.71 [0.55–0.91]; 0.007	---
Other	1.11 [0.66–1.87]; 0.700		1.04 [0.64–1.72]; 0.865	---
Unknown	0.94 [0.72–1.22]; 0.645		0.85 [0.66–1.10]; 0.225	---
Geographical region (Ref: Central/Western Europe)				
UK/Ireland	1.08 [0.85–1.37]; 0.540	1.36 [0.91–2.01]; 0.131	1.16 [0.92–1.47]; 0.211	1.28 [0.88–1.8 0.197
Thailand	0.97 [0.54–1.75]; 0.921	1.63 [0.79–3.36]; 0.187	0.98 [0.56–1.72]; 0.943	1.73 [0.91–3.3 0.095
Eastern Europe	0.88 [0.64–1.21]; 0.434	0.99 [0.62–1.57]; 0.956	0.70 [0.51–0.94]; 0.020	0.81 [0.53–1.2 0.333

bPI, boosted protease inhibitor – Lopinavir (LPV); **NRTI,** nucleoside reverse transcriptase inhibitors; **NNRTI,** non-nucleoside reverse transcriptase inhibitor – Nevirapine (NVP). *****Criteria for inclusion into the multivariable model: univariable model P<0.10, along with those identified *a priori*[#] (geographical region and initial cART regimen). **Note:** multivariable models include ≥1 predictor*time (_t) interaction term if found to be significant at P<0.05 (initial cART regimen and/or geographical region).

Supplementary Table 2. Sensitivity analyses of multiply imputed data

Predictors	**Virological suppression [Midpoint]**						**Virologic**	
	Univariable model			**Multivariable model***			**Univaria**	
	HR	**[95% CI]**	**P-value**	**aHR**	**[95% CI]**	**P-value**	**HR**	**[95**
At cART initiation								
Age (per month older)	0.80	[0.75–0.86]	<0.001	0.86	[0.80–0.92]	<0.001	0.80	[0. 0.8
CD4% (per 10% higher)	1.16	[1.08–1.25]	<0.001	1.12	[1.02–1.22]	0.018	1.16	[1. 1.2
CD4 count (per 500 cell higher)	1.12	[1.07–1.17]	<0.001	---	---	---	1.12	[1. 1.1
Viral load (per $\log_{10}$ higher)	0.76	[0.70–0.82]	<0.001	0.74	[0.67–0.82]	<0.001	0.77	[0. 0.8
Gender (Ref: Male)								
Female	1.04	[0.85–1.28]	0.679				1.04	[0. 1.2
Infant PMTCT (Ref: No)								
Yes	1.19	[0.94–1.50]	0.141				1.14	[0. 1.4
Maternal PMTCT (Ref: No)								
Yes	1.29	[1.03–	0.028	---	---	---	1.28	[1.

		1.62]						1.6
Birth abroad (Ref: No)								
Yes	0.97	[0.70–1.36]	0.874				0.95	[0. 1.3
Year of birth (Ref: <2000)								
≥2000	1.46	[0.94–2.27]	0.088	---	---	---	1.48	[0. 2.2
CDC C event by cART initiation (Ref: No)								
Yes	0.75	[0.56–1.00]	0.046	---	---	---	0.81	[0. 1.0
Year of cART initiation (Ref: 1998-<2004)								
2004-<2008	0.95	[0.73–1.23]	0.693				0.93	[0. 1.2
≥2008	1.02	[0.79–1.31]	0.884				1.01	[0. 1.3
Initial cART regimen (Ref: bPI+NRTI)								
NNRTI+2NRTI	1.05	[0.84–1.32]	0.677	1.13	[0.84–1.52]	0.405	1.07	[0. 1.3
NNRTI+3NRTI	1.24	[0.94–1.64]	0.122	1.03	[0.67–1.60]	0.881	1.33	[1. 1.7
Ethnicity (Ref: Black)								
White	0.71	[0.55–0.91]	0.007	---	---	---	0.64	[0. 0.8
Other	1.04	[0.64–1.72]	0.865	---	---	---	0.94	[0. 1.5
Unknown	0.85	[0.66–1.10]	0.225	---	---	---	0.82	[0. 1.0
Geographical region (Ref: Central/Western Europe)								
UK/Ireland	1.16	[0.92–1.47]	0.211	1.21	[0.88–1.65]	0.234	1.25	[0. 1.5
Thailand	0.98	[0.56–1.72]	0.943	1.72	[0.96–3.07]	0.069	0.92	[0. 1.6
Eastern Europe	0.70	[0.51–0.94]	0.020	0.84	[0.60–1.17]	0.298	0.66	[0. 0.8

bPI, boosted protease inhibitor – Lopinavir (LPV); **NRTI,** nucleoside reverse transcriptase inhibitors; **NNRTI,** non-nucleoside reverse transcriptase inhibitor – Nevirapine (NVP). *****Criteria for inclusion into the multivariable model: univariable model P<0.10, along with those identified *a priori*[#] (geographical region and initial cART regimen). **Note:** multivariable models include ≥1 predictor*time (_t) interaction term if found to be significant at P<0.05 (initial cART regimen and geographical region).

APPENDIX: COLLABORATING COHORTS

Belgium: Hospital St Pierre Cohort, Brussels: Tessa Goetghebuer, MD, PhD; Marc Hainaut, MD PhD; Evelyne Van der Kelen, Research nurse; Marc Delforge, data manager.
France: French Perinatal Cohort Study/Enquête Périnatale Française, ANRS EPF-CO10. Coordinating center, INSERM U1018, team 4: Josiane Warszawski, Jerome Le Chenadec, Elisa Ramos, Olivia Dialla, Thierry Wack, Corine Laurent, Lamya Ait si Selmi, Isabelle Leymarie, Fazia Ait Benali, Maud Brossard, Leila Boufassa
Participating sites (hospital name, city, main investigator): Hôpital Louis Mourier, Colombes, Dr Corinne Floch-Tudal; Groupe Hospitalier Cochin Tarnier Port-Royal, PARIS, Dr Ghislaine Firtion; Centre Hospitalier Intercommunal, Creteil, Dr Isabelle Hau; Centre Hospitalier Général, Villeneuve Saint Georges, Dr Anne Chace; Centre Hospitalier Général- Hôpital Delafontaine, Saint-Denis, Dr Pascal Bolot; Groupe Hospitalier Necker, Paris, Pr Stéphane Blanche; Centre hospitalier Francilien Sud, Corbeil Essonne, Dr Michèle Granier; Hôpital Antoine Béclère, Clamart, Pr Philippe Labrune; Hôpital Jean Verdier, Bondy, Dr Eric Lachassine; Hôpital Trousseau, Paris, Dr Catherine Dollfus; Hôpital Robert Debré, Paris, Dr Martine Levine; Hôpital Bicêtre, Le Kremlin Bicêtre, Dr Corinne Fourcade; Centre Hospitalier Intercommunal, Montreuil, Dr Brigitte Heller- Roussin; Centre Hospitalier Pellegrin, Bordeaux, Dr Camille Runel-Belliard; CHU Paule de Viguier, Toulouse, Dr Joëlle Tricoire; CHU Hôpital de l'Archet II, Nice, Dr Fabrice Monpoux; Groupe Hospitalier de la Timone, Marseille; CHU Hôpital Jean Minjoz, Besancon, Dr Catherine Chirouze; CHU Nantes Hotel Dieu, Nantes, Dr Véronique Reliquet; CHU Caen, Caen, Pr Jacques Brouard; Institut d'Hématologie et Oncologie Pédiatrique, Lyon, Dr Kamila Kebaili; CHU Angers, Angers, Dr Pascale Fialaire; CHR Arnaud de Villeneuve, Montpellier, Dr Muriel Lalande; CHR Jeanne de Flandres, Lille, Dr Françoise Mazingue; Hôpital Civil, Strasbourg, Dr Maria Luisa Partisani
Germany: German Paediatric & Adolescent HIV Cohort (GEPIC): Dr Christoph Königs, Dr Stephan Schultze-Strasser. German clinical centers: Hannover Medical School, Dr. U. Baumann; Pediatric Hospital Krefeld, Dr. T. Niehues; University Hospital Düsseldorf, Dr. J. Neubert; University Hospital Hamburg, Dr. R. Kobbe; Charite Berlin, Dr. C. Feiterna-Sperling; University Hospital Frankfurt, Dr. C. Königs; University Hospital Mannheim, Dr. B. Buchholz; Munich University Hospital, Dr. G. Notheis
Greece: Greek cohort: Vana Spoulou.

Italy: Italian Register for HIV infection in Children. Coordinators: Maurizio de Martino (Florence), Pier Angelo Tovo (Turin). Participants: Osimani Patrizia (Ancona), Domenico Larovere (Bari), Maurizio Ruggeri (Bergamo), Giacomo Faldella, Francesco Baldi (Bologna) Raffaele Badolato (Brescia), Carlotta Montagnani, Elisabetta Venturini, Catiuscia Lisi (Florence), Antonio Di Biagio, Lucia Taramasso (Genua), Vania Giacomet, Paola Erba, Susanna Esposito, Rita Lipreri, Filippo Salvini, Claudia Tagliabue (Milan), Monica Cellini (Modena), Eugenia Bruzzese, Andrea Lo Vecchio (Naples), Osvalda Rampon, Daniele Donà (Padua), Amelia Romano (Palermo), Icilio Dodi (Parma), Anna Maccabruni (Pavia), Rita Consolini (Pisa), Stefania Bernardi, Hyppolite Tchidjou Kuekou, Orazio Genovese (Rome), Paolina Olmeo (Sassari), Letizia Cristiano (Taranto), Antonio Mazza (Trento), Clara Gabiano, Silvia Garazzino (Turin), Antonio Pellegatta (Varese)

Netherlands: The ATHENA database is maintained by Stichting HIV Monitoring and supported by a grant from the Dutch Ministry of Health, Welfare and Sport through the Centre for Infectious Disease Control of the National Institute for Public Health and the Environment.

CLINICAL CENTRES (PAEDIATRIC CARE)
Emma Kinderziekenhuis, Amsterdam Universitair Medische Centra: *HIV treating physicians:* D. Pajkrt, H.J. Scherpbier. *HIV nurse consultants:* C. de Boer, A.M. Weijsenfeld. *HIV clinical virologists/chemists:* S. Jurriaans, N.K.T. Back, H.L. Zaaijer, B. Berkhout, M.T.E. Cornelissen, C.J. Schinkel, K.C. Wolthers. **Erasmus MC–Sophia, Rotterdam:** *HIV treating physicians:* P.L.A. Fraaij, A.M.C. van Rossum, C.L. Vermont. *HIV nurse consultants:* L.C. van der Knaap, E.G. Visser. *HIV clinical virologists/chemists:* C.A.B. Boucher, M.P.G Koopmans, J.J.A van Kampen, S.D. Pas. **Radboudumc, Nijmegen:** *HIV treating physicians:* S.S.V. Henriet, M. van de Flier, K. van Aerde. *HIV nurse consultants:* R. Strik-Albers. *HIV clinical virologists/chemists:* J. Rahamat-Langendoen, F.F. Stelma. **Universitair Medisch Centrum Groningen, Groningen:** *HIV treating physicians:* E.H. Schölvinck. *HIV nurse consultants:* H. de Groot-de Jonge. *HIV clinical virologists/chemists:* H.G.M. Niesters, C.C. van Leer-Buter, M. Knoester. **Wilhelmina Kinderziekenhuis, UMC Utrecht, Utrecht:** *HIV treating physicians:* L.J. Bont, S.P.M. Geelen, T.F.W. Wolfs. *HIV nurse consultants:* N. Nauta. *HIV clinical virologists/chemists:* R. Schuurman, F. Verduyn-Lunel, A.M.J. Wensing.

COORDINATING CENTRE
Director: P. Reiss. *Data analysis:* D.O. Bezemer, A.I. van Sighem, C. Smit, F.W.M.N. Wit, T.S. Boender. *Data management and quality control:* S. Zaheri, M. Hillebregt, A. de Jong. *Data monitoring:* D. Bergsma, S. Grivell, A. Jansen, M. Raethke, R. Meijering. *Data collection:* L. de Groot, M. van den Akker, Y. Bakker, E. Claessen, A. El Berkaoui, J. Koops, E. Kruijne, C. Lodewijk, L. Munjishvili, B. Peeck, C. Ree, R. Regtop, Y. Ruijs, T. Rutkens, M. Schoorl, A. Timmerman, E. Tuijn, L. Veenenberg, S. van der Vliet, A. Wisse, T. Woudstra. *Patient registration:* B. Tuk.
Poland: Polish paediatric cohort: Head of the team: Prof Magdalena Marczyńska, MD, PhD. Members of the team: Jolanta Popielska, MD, PhD; Maria Pokorska-Śpiewak, MD, PhD; Agnieszka Oldakowska, MD, PhD; Konrad Zawadka, MD, PhD; Urszula Coupland, MD, PhD. Administration assistant: Małgorzata Doroba. Affiliation: Medical University of Warsaw, Poland, Department of Children's Infectious Diseases; Hospital of Infectious Diseases in Warsaw, Poland.
Portugal: Centro Hospitalar do Porto:Laura Marques, Carla Teixeira, Alexandre Fernandes.
Portugal: Hospital de Santa Maria/CHLN: Filipa Prata.
Romania: ``Victor Babes'' Hospital Cohort, Bucharest: Dr Luminita Ene.
Russia: Federal State-owned Institution ``Republican Clinical Infectious Diseases Hospital'' of the Ministry of Health of the Russian Federation, St Petersburg: Liubov Okhonskaia, Evgeny Voronin, Milana Miloenko, Svetlana Labutina
Spain: CoRISPE-cat, Catalonia: financial support for CoRISPE-cat was provided by the Instituto de Salud Carlos III through the Red Temática de Investigación Cooperativa en Sida. Members: Hospital Universitari Vall d'Hebron, Barcelona (Pere Soler-Palacín,

Maria Antoinette Frick and Santiago Pérez-Hoyos (statistician)), Hospital Universitari del Mar, Barcelona (Antonio Mur, Núria López), Hospital Universitari Germans Trias i Pujol, Badalona (María Méndez), Hospital Universitari JosepTrueta, Girona (Lluís Mayol), Hospital Universitari Arnau de Vilanova, Lleida (Teresa Vallmanya), Hospital Universitari Joan XXIII, Tarragona (Olga Calavia), Consorci Sanitari del Maresme, Mataró (Lourdes García), Hospital General de Granollers (Maite Coll), Corporació Sanitària Parc Taulí, Sabadell (Valentí Pineda), Hospital Universitari Sant Joan, Reus (Neus Rius), Fundació Althaia, Manresa (Núria Rovira), Hospital Son Espases, Mallorca (Joaquín Dueñas) and Hospital Sant Joan de Déu, Esplugues (Clàudia Fortuny, Antoni Noguera-Julian).

Spain: CoRISPE and Madrid cohort: María José Mellado, Luis Escosa, Milagros García Hortelano, Talía Sainz (Hospital La Paz); María Isabel González-Tomé, Luis Prieto, Pablo Rojo, Daniel Blázquez (Hospital Doce de Octubre, Madrid); José Tomás Ramos (Hospital Clínico San Carlos, Madrid); Sara Guillén (Hospital de Getafe); María Luisa Navarro, Jesús Saavedra, Mar Santos, Mª Angeles Muñoz, Beatriz Ruiz, Carolina Fernandez Mc Phee, Santiago Jimenez de Ory, Susana Alvarez (Hospital Gregorio Marañón); Miguel Ángel Roa (Hospital de Móstoles); José Beceiro (Hospital Príncipe de Asturias, Alcalá de Henares); Jorge Martínez (Hospital Niño Jesús, Madrid); Katie Badillo (Hospital de Torrejón); Miren Apilanez (Hospital de Donostia, San Sebastián); Itziar Pocheville (Hospital de Cruces, Bilbao); Elisa Garrote (Hospital de Basurto, Bilbao); Elena Colino (Hospital Insular Materno Infantil, Las Palmas de Gran Canaria); Jorge Gómez Sirvent (Hospital Virgen de la Candelaria, Santa Cruz de Tenerife); Mónica Garzón, Vicente Román (Hospital de Lanzarote); Abián Montesdeoca, Mercedes Mateo (Complejo Universitario de Canarias, La Laguna-Tenerife),María José Muñoz, Raquel Angulo (Hospital de Poniente, El Ejido); Olaf Neth, Lola Falcón (Hospital Virgen del Rocio, Sevilla); Pedro Terol (Hospital Virgen de la Macarena, Sevilla); Juan Luis Santos (Hospital Virgen de las Nieves, Granada); David Moreno (Hospital Carlos Haya, Málaga); Francisco Lendínez (Hospital de Torrecárdenas, Almería); Ana Grande (Complejo Hospitalario Universitario Infanta Cristina, Badajoz); Francisco José Romero (Complejo Hospitalario de Cáceres); Carlos Pérez (Hospital de Cabueñes, Gijón); Miguel Lillo (Hospital de Albacete); Begoña Losada (Hospital Virgen de la Salud, Toledo); Mercedes Herranz (Hospital Virgen del Camino, Pamplona); Matilde Bustillo, Carmelo Guerrero (Hospital Miguel Servet, Zaragoza); Pilar Collado (Hospital Clínico Lozano Blesa, Zaragoza); José Antonio Couceiro (Complejo Hospitalario de Pontevedra); Amparo Pérez, Ana Isabel Piqueras, Rafael Bretón, Inmaculada Segarra (Hospital La Fe, Valencia); César Gaviláin (Hospital San Juan de Alicante); Enrique Jareño (Hospital Clínico de Valencia); Elena Montesinos (Hospital General de Valencia); Marta Dapena (Hospital de Castellón); Cristina Álvarez (Hospital Marqués de Valdecilla, Santander); Ana Gloria Andrés (Hospital de León); Víctor Marugán, Carlos Ochoa (Hospital de Zamora); Santiago Alfayate, Ana Isabel Menasalvas (Hospital Virgen de la Arrixaca, Murcia); Elisa de Miguel (Complejo Hospitalario San Millán-San Pedro, Logroño) and Paediatric HIV-BioBank integrated in the Spanish AIDS Research Network and collaborating Centers.

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Switzerland: *Members of the Swiss HIV Cohort Study (SHCS) and the Swiss Mother and Child HIV Cohort Study:* Aebi-Popp K, Asner S, Aubert V, Battegay M, Baumann M, Bernasconi E, Böni J, Brazzola P, Bucher HC, Calmy A, Cavassini M, Ciuffi A, Duppenthaler A, Dollenmaier G, Egger M, Elzi L, Fehr J, Fellay J, Francini K, Furrer H, Fux CA, Grawe C, Günthard HF (President of the SHCS), Haerry D (deputy of ``Positive Council"), Hasse B, Hirsch HH, Hoffmann M, Hösli I, Kahlert C, Kaiser L, Keiser O, Klimkait T, Kovari H, Kouyos RD, Ledergerber B, Martinetti G, Martinez de Tejada B, Metzner KJ, Müller, Nicca D, Paioni P, Pantaleo G, Polli Ch, Posfay-Barbe K, Rauch A, Rudin C (Chairman of the Mother & Child Substudy), Schmid P, Scherrer AU (Head of Data Centre), Speck R, Tarr P, Thanh Lecompte M, Trkola A, Vernazza P, Wagner N, Wandeler G, Weber R, Wyler CA, Yerly S. *Funding:* the Swiss HIV Cohort Study is supported by the Swiss National Science Foundation (grant #148522), and by the SHCS research foundation.
Thailand: Program for HIV Prevention & Treatment (PHPT). Participating hospitals: Lamphun: Pornpun Wannarit; Phayao Provincial Hospital: Pornchai Techakunakorn; Chiangrai Prachanukroh: Rawiwan Hansudewechakul; Chiang Kham: Vanichaya Wanchaitanawong; Phan: Sookchai Theansavettrakul; Mae Sai: Sirisak Nanta; Prapokklao: Chaiwat Ngampiyaskul; Banglamung: Siriluk Phanomcheong; Chonburi: Suchat Hongsiriwon; Rayong: Warit Karnchanamayul; Bhuddasothorn Chacheongsao: Ratchanee Kwanchaipanich; Nakornping: Suparat Kanjanavanit; Somdej Prapinklao: Nareerat Kamonpakorn, Maneeratn Nantarukchaikul; Bhumibol Adulyadej: Prapaisri Layangool, Jutarat Mekmullica; Pranangklao: Paiboon Lucksanapisitkul, Sudarat Watanayothin; Buddhachinaraj: Narong Lertpienthum; Hat Yai: Boonyarat Warachit; Regional Health Promotion Center 6, Khon Kaen: Sansanee Hanpinitsak; Nong Khai: Sathit Potchalongsin; Samutsakhon: Pimpraphai Thanasiri, Sawitree Krikajornkitti; Phaholpolphayuhasena: Pornsawan Attavinijtrakarn; Kalasin: Sakulrat Srirojana; Nakhonpathom: Suthunya Bunjongpak; Samutprakarn: Achara Puangsombat; Mahasarakam: Sathaporn Na-Rajsima; Roi-et: Pornchai Ananpatharachai; Sanpatong: Noppadon Akarathum; Vachira Phuket: Weerasak Lawtongkum; Chiangdao: Prapawan Kheunjan, Thitiporn Suriyaboon, Airada Saipanya.
Data management team: Kanchana Than-in-at, Nirattiya Jaisieng, Rapeepan Suaysod, Sanuphong Chailoet, Naritsara Naratee, and Suttipong Kawilapat.
Ukraine: Paediatric HIV Cohort: Dr T. Kaleeva, Dr Y. Baryshnikova (Odessa Regional Centre for HIV/AIDS, Dr S. Soloha (Donetsk Regional Centre for HIV/AIDS), Dr N. Bashkatova (Mariupol AIDS Center), Dr I. Raus (Kiev City Centre for HIV/AIDS), Dr O. Glutshenko, Dr Z. Ruban (Mykolaiv Regional Centre for HIV/AIDS), Dr N. Prymak (Kryvyi Rih), Dr G. Kiseleva (Simferopol), Dr H. Bailey (UCL, London, UK). Funding acknowledgement: PENTA Foundation.

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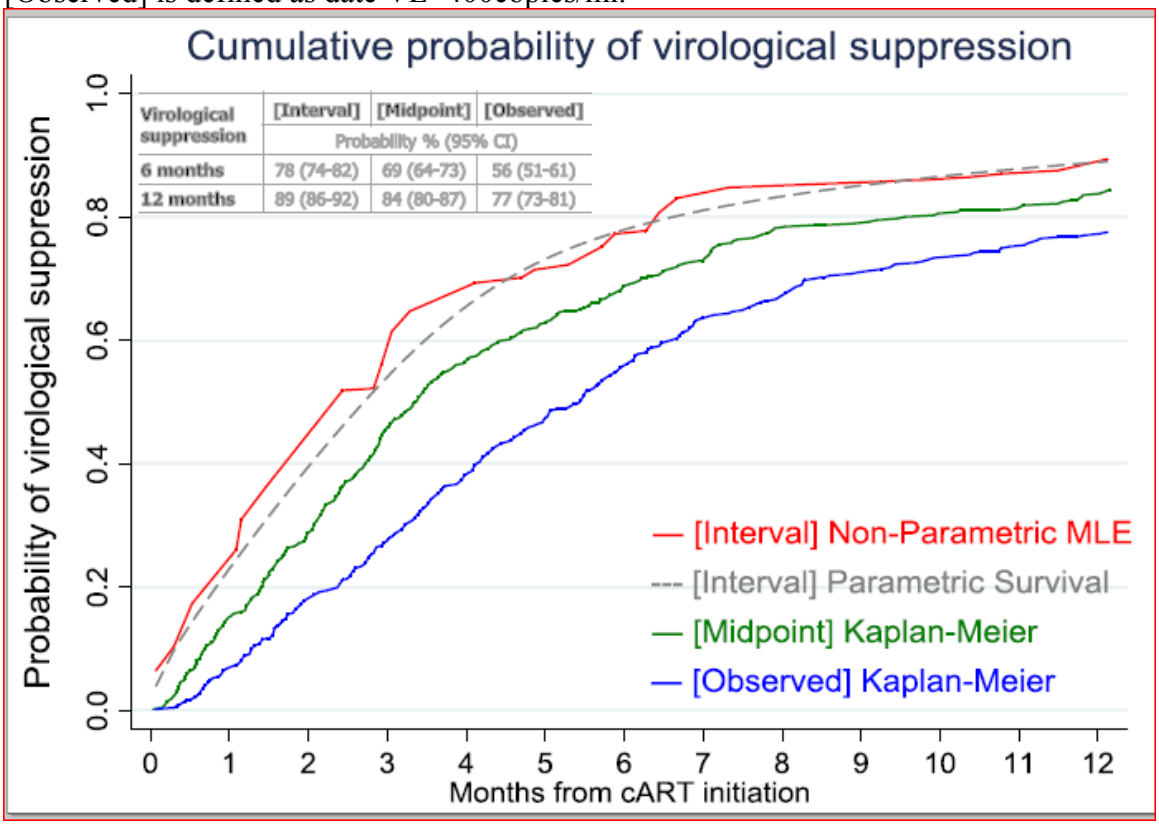
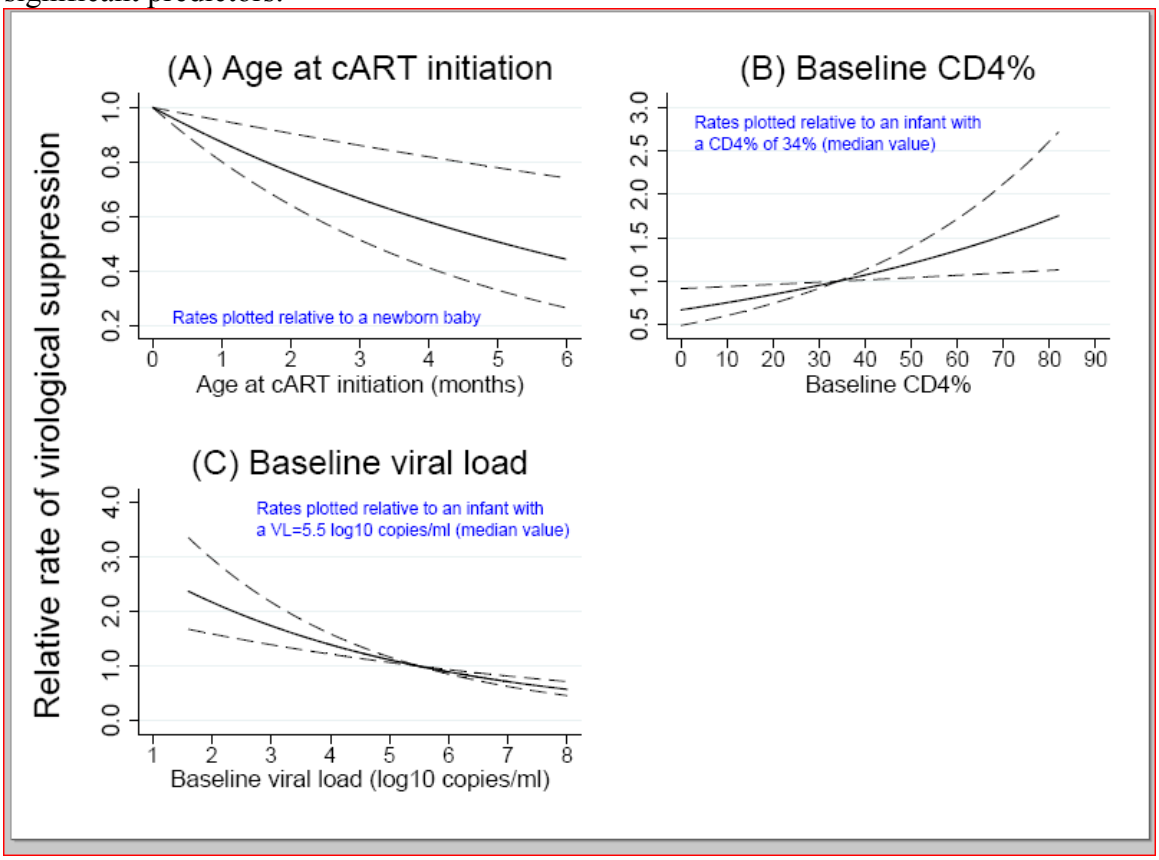
National Study of HIV in Pregnancy and Childhood, UCL: Helen Peters, Claire Thorne
Participating hospitals: Republic of Ireland: Our Lady's Children's Hospital Crumlin, Dublin: K Butler, A Walsh. UK: Birmingham Heartlands Hospital, Birmingham: L Thrasyvoulou, S Welch; Bristol Royal Hospital for Children, Bristol: J Bernatoniene, F Manyika; Calderdale Royal Hospital, Halifax: G Sharpe; Derby: B Subramaniam; Middlesex: K Sloper; Eastbourne District General Hospital, Eastbourne: K Fidler, Glasgow Royal Hospital for Sick Children, Glasgow:, R Hague, V Price; Great Ormond St Hospital for Children, London: M Clapson, J Flynn, A Cardoso M Abou – Rayyah, N Klein,, D Shingadia; Homerton University Hospital, London: D Gurtin, John Radcliffe Hospital, Oxford: S Yeadon, S Segal; King's College Hospital, London: C Ball, S Hawkins; Leeds General Infirmary, Leeds: , M Dowie; Leicester Royal Infirmary, Leicester: S Bandi, E Percival; Luton and Dunstable Hospital, Luton: M Eisenhut; K Duncan, S Clough; Milton Keynes General Hospital, Milton Keynes: Dr L Anguvaa, S Conway, Newcastle General, Newcastle: T Flood, A Pickering; North Manchester General, Manchester: P McMaster C Murphy; North Middlesex Hospital, London: J Daniels, Y Lees; Northampton General Hospital, Northampton: F Thompson; Northwick Park Hospital Middlesex;, B Williams, S Pope; Nottingham QMC, Nottingham: L Cliffe, A Smyth, S Southall; Queen Alexandra Hospital, Portsmouth: A Freeman; Raigmore Hospital, Inverness: H Freeman; Royal Belfast Hospital for Sick Children, Belfast: S Christie; Royal Berkshire Hospital, Reading: A Gordon; Royal Children's Hospital, Aberdeen: D Rogahn L Clarke; Royal Edinburgh Hospital for Sick Children, Edinburgh: L Jones, B Offerman; Royal Free Hospital, London: M Greenberg; Royal Liverpool Children's Hospital, Liverpool: C Benson, A Riordan; Sheffield Children's Hospital, Sheffield: L Ibberson, F Shackley; Southampton General Hospital, Southampton: SN Faust, J Hancock; St George's Hospital, London: K Doerholt,, K Prime, M Sharland, S Storey; St Mary's Hospital, London: H Lyall, C Monrose, P Seery, G Tudor-Williams; St Thomas' Hospital (Evelina Children's Hospital), London:, E Menson, A Callaghan;; Royal Stoke University Hospital, Stoke On Trent: A Bridgwood, P McMaster; University Hospital of Wales, Cardiff: J Evans, E Blake; Wexham Park, Slough: A Yannoulias.

Supplementary Figure 1. Cumulative probability of virological suppression
This figure shows the cumulative probabilities of achieving virological suppression [Interval] during the first 12 months of antiretroviral therapy, estimated using the flexible parametric survival model. In sensitivity analyses, the probabilities of virological suppression [Interval] estimated using the non-parametric MLE method were very similar to those obtained using the flexible parametric survival model. The cumulative probabilities of achieving virological suppression [Midpoint] and [Observed] were estimated using the Kaplan-Meier method. Virological suppression [Midpoint] is defined as the midpoint between last VL≥400 and first VL<400copies/ml; virological suppression [Observed] is defined as date VL<400copies/ml.



Supplementary Figure 2. Functional form of significant predictors of virological suppression

Relative rate of virological suppression by: (A) age at cART initiation [rates plotted relative to a newborn baby]; **(B) baseline CD4%** [rates plotted relative to an infant with a CD4% = 34% (median value)]; **(C) baseline log_{10} viral load** [rates plotted relative to an infant with a VL = 5.5 log_{10} copies/ml (median value)]. Relative rate of suppression for significant predictors was predicted from a multivariable proportional hazard regression spline model. A linear relationship with outcome was observed for all significant predictors.



SUPPLEMENTARY APPENDIX

Table below shows that the proportions missing versus non-missing viral loads were not significantly different by age bracket (p=0.795).

	Baseline VL		
ageartmCAT	NotMiss	Miss	Total
0-<1 months	62	18	80
	77.50	22.50	100.00
1-<2 months	48	10	58
	82.76	17.24	100.00
2-<3 months	73	17	90
	81.11	18.89	100.00
3-<4 months	69	12	81
	85.19	14.81	100.00
4-<5 months	62	11	73
	84.93	15.07	100.00
5-<6 months	30	8	38
	78.95	21.05	100.00
Total	344	76	420
	81.90	18.10	100.00

Pearson chi2(5) = 2.3777 Pr = 0.795