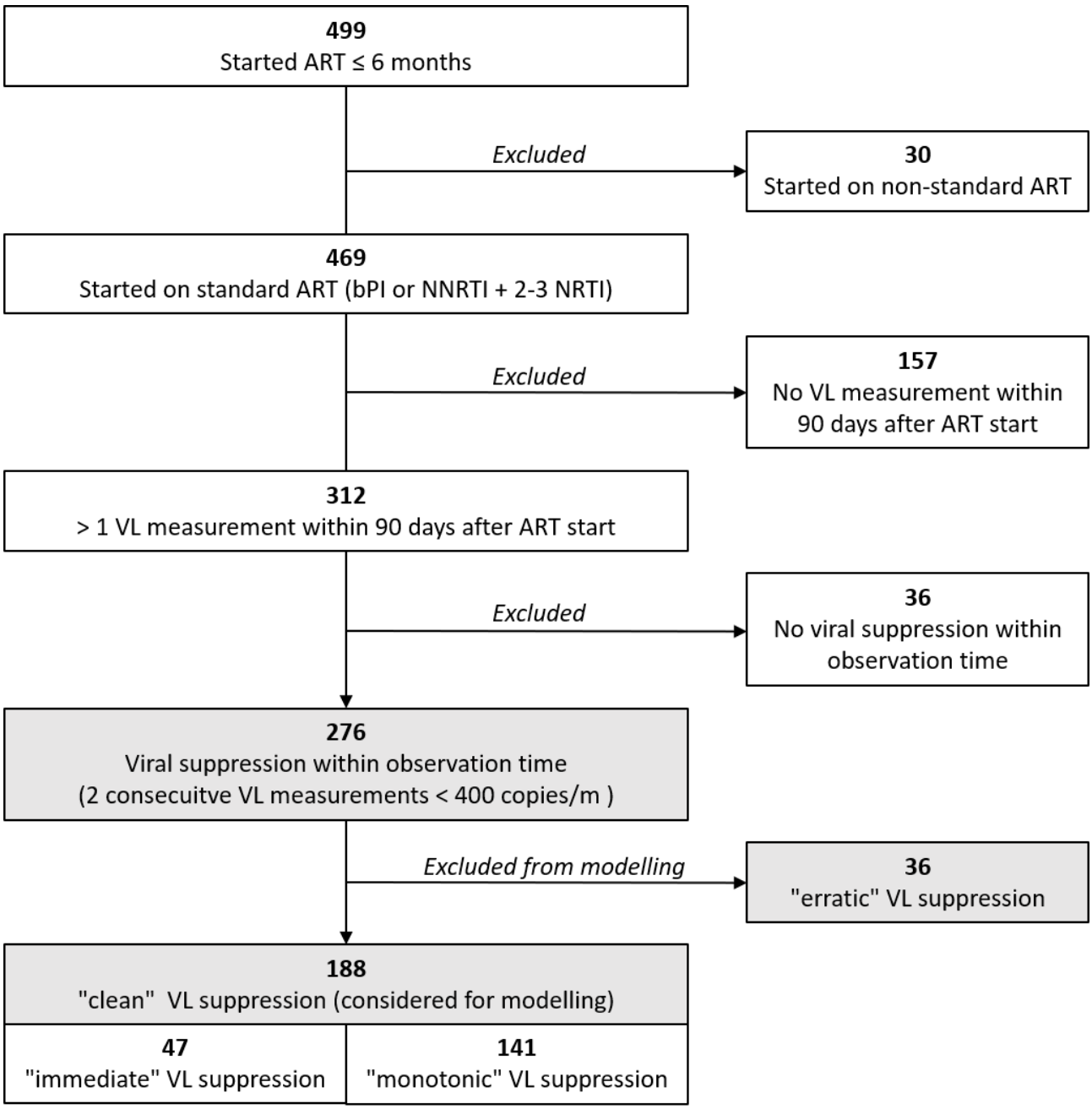


Figure S1: Study inclusion criteria. This flow chart shows the selection of infants from 499 infants of the EPPICC who started ART within 6 months after birth. Those subsets considered for our study are grey shaded.

Table S1: Baseline study characteristics.

	Total (n=312)		**Suppressor** (n=276)		**Clean** (n=188)		**Erratic** (n=88)	
Variables	n	%	n	%	n	%	n	%
Gender								
Female	187	59.9	164	59.4	112	59.6	52	59.1
Male	125	40.1	112	40.6	76	40.4	36	40.9
Ethnicity								
White	92	29.5	79	28.6	58	30.9	21	23.9
Black	107	34.3	100	36.2	63	33.5	37	42
Other (Asian)	9	2.9	8	2.9	4	2.1	4	4.5
Unknown	104	33.3	89	32.2	63	33.5	26	29.5
Geographical region								
Central and Western Europe	188	60.3	166	60.1	123	65.4	43	48.9
UK/Ireland	98	31.4	94	34.1	56	29.8	38	43.2
Eastern Europe	21	6.7	12	4.3	8	4.3	4	4.5
Thailand	5	1.6	4	1.4	1	0.5	3	3.4
ART regime								
bPI + ≥ 2 NRTI	129	41.3	105	38	79	42	26	29.5
NNRTI + 2 NRTI	116	37.2	109	39.5	66	35.1	43	48.9
NNRTI + 3 NRTI	67	21.5	62	22.5	43	22.9	19	21.6
Age at ART start (in days)								
median [IQR]	83	[38, 121]	82	[34, 121]	79	[31, 120]	83	[43, 121]
Baseline log_{10}(VL) (copies/ml) [ab]	145	46.5	128	46.4	87	46.3	41	46.6
median [IQR]	5.4	[4.3, 5.9]	5.3	[4.2, 5.9]	5.4	[4.4, 5.9]	5.0	[4.2, 5.9]
Baseline CD4 counts (cells/µl) [ab]	117	37.5	104	37.7	72	38.3	32	36.4
median [IQR]	1592	[816, 2350]	1600	[868, 2429]	1648	[1016, 2465]	1530	[529, 2163]
Baseline CD4% [abc]	109	34.9	99	35.9	69	36.7	30	34.1
median [IQR]	33	[22.0, 43.0]	33	[22.5, 42.5]	35	[26.0, 46.0]	29.5	[20.3, 34.0]

bPI, boosted protease inhibitor; NRTI, nucleoside reverse transcriptase inhibitor; NNRTI, non-nucleoside reverse transcriptase inhibitor

[a] baseline measurements within 10 days prior to ART start

[b] Number of available data is shown

[c] CD4% of total lymphocytes

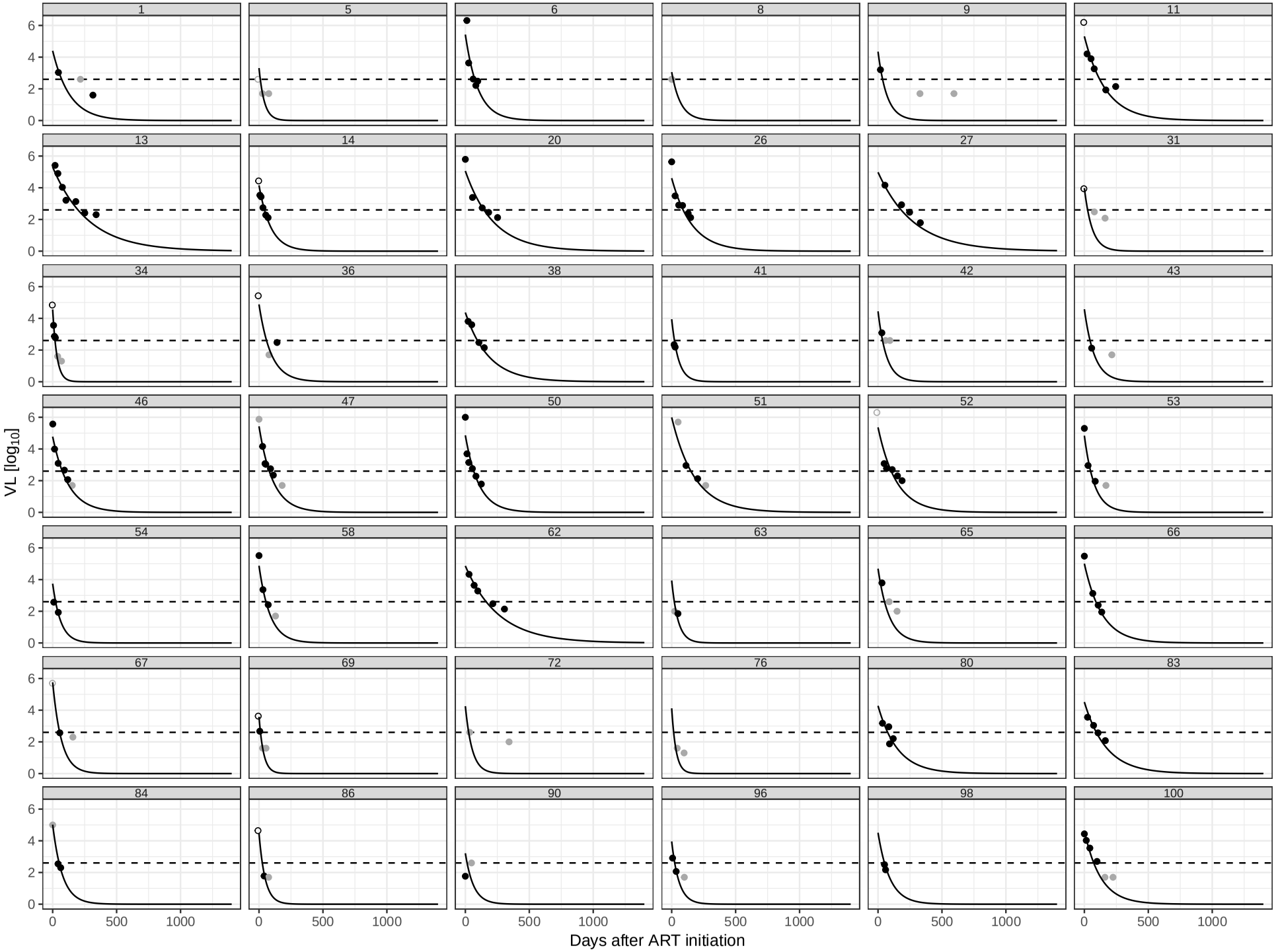
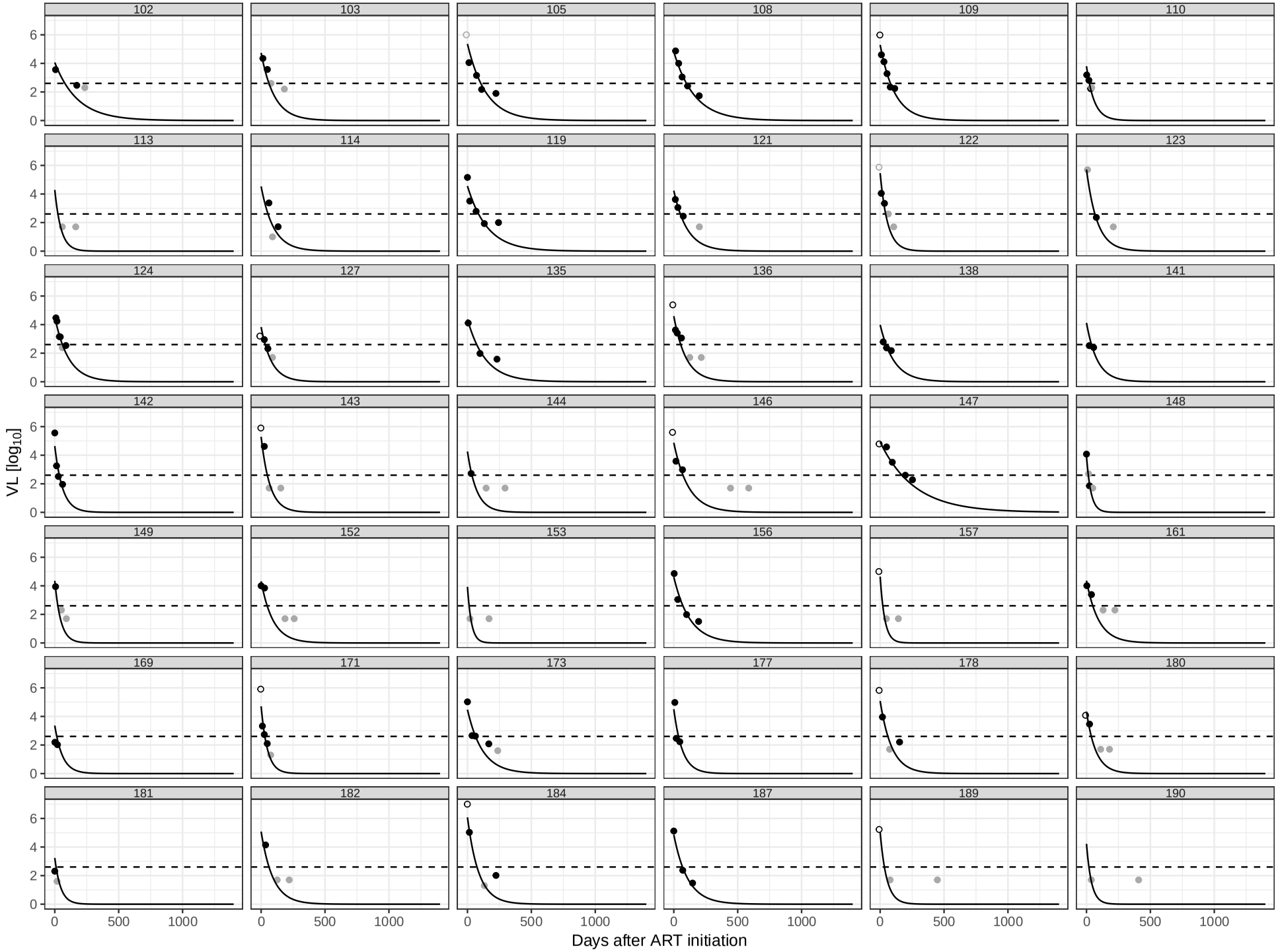


Figure S2: Continued.



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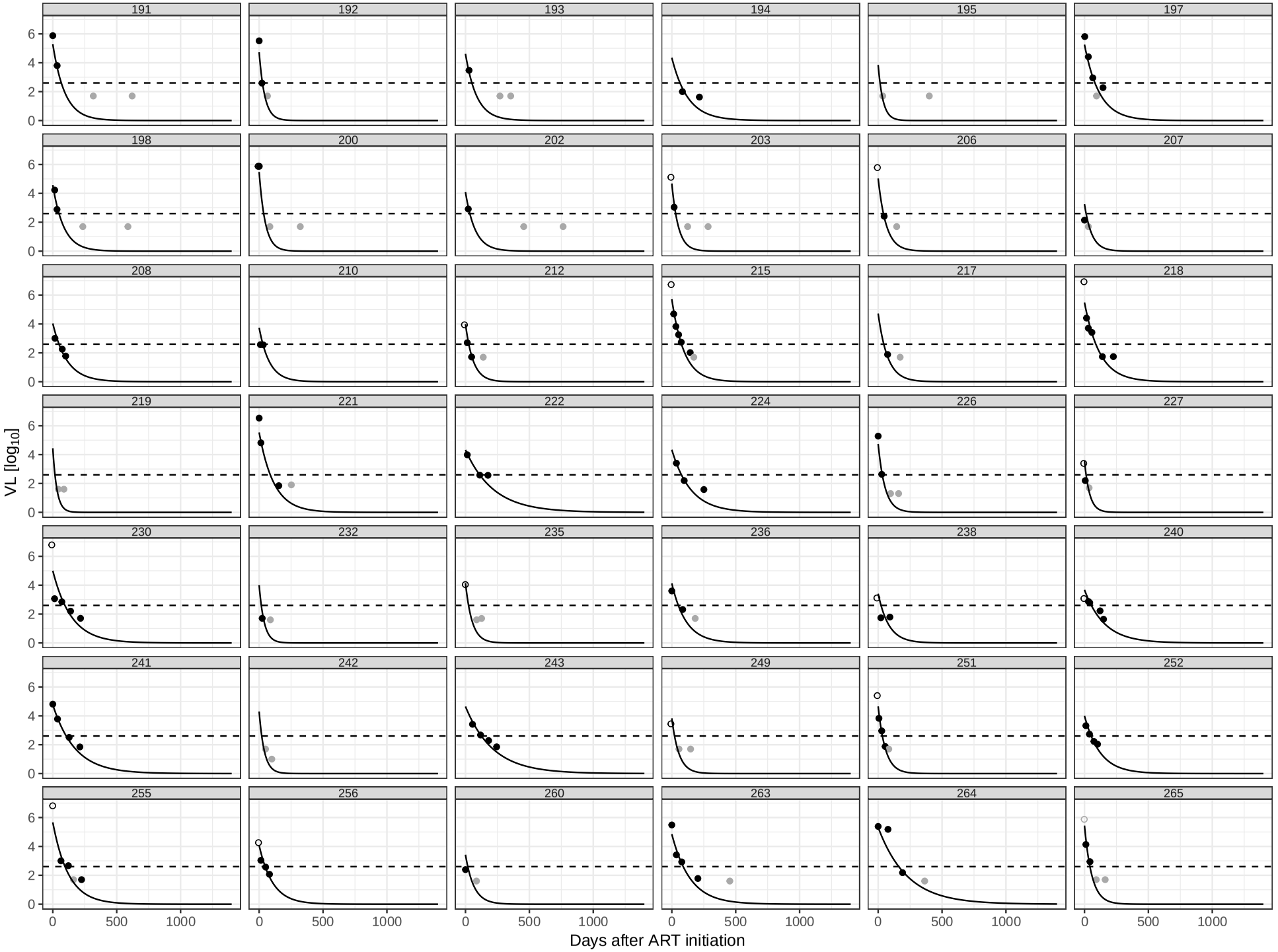

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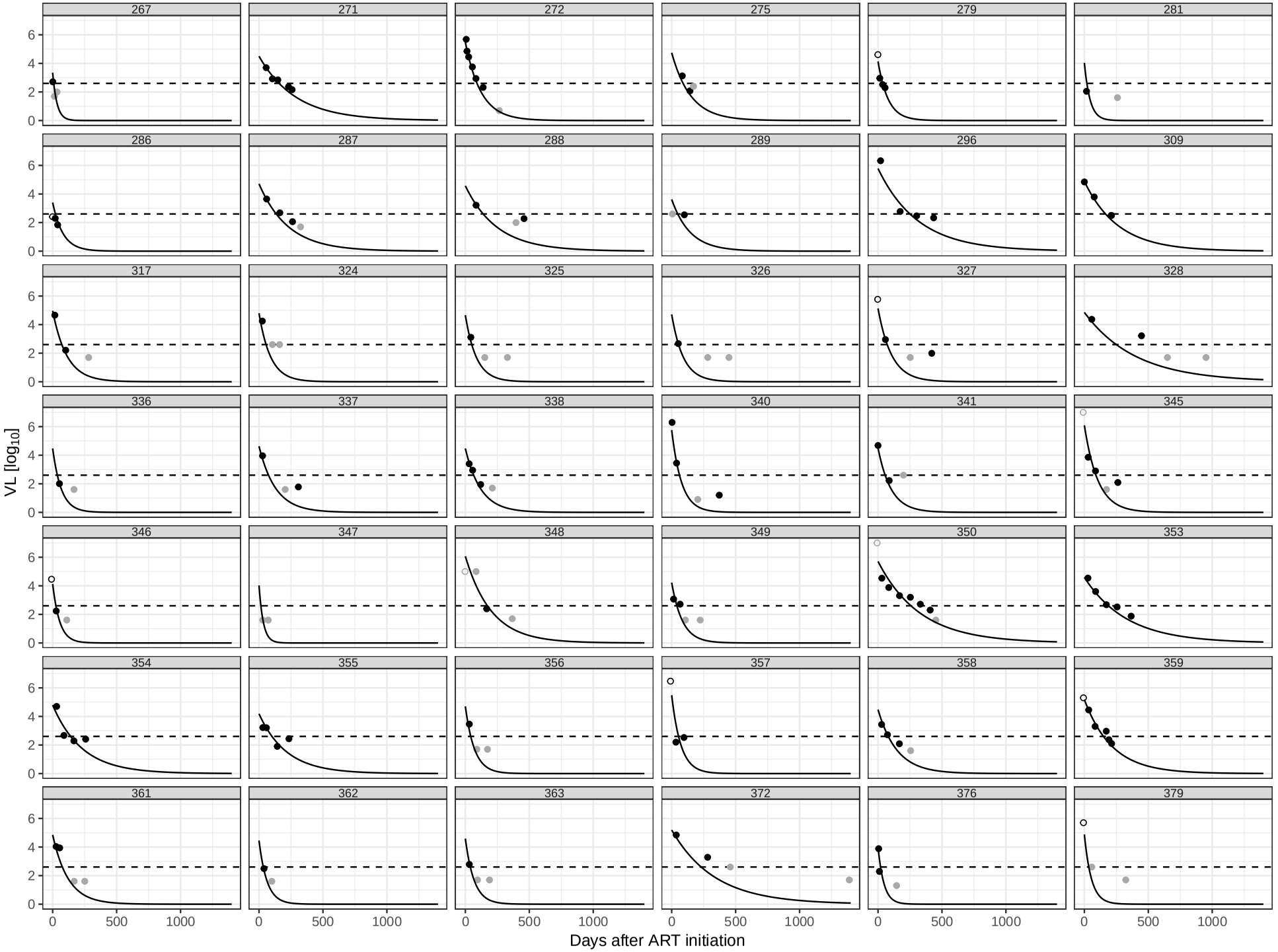

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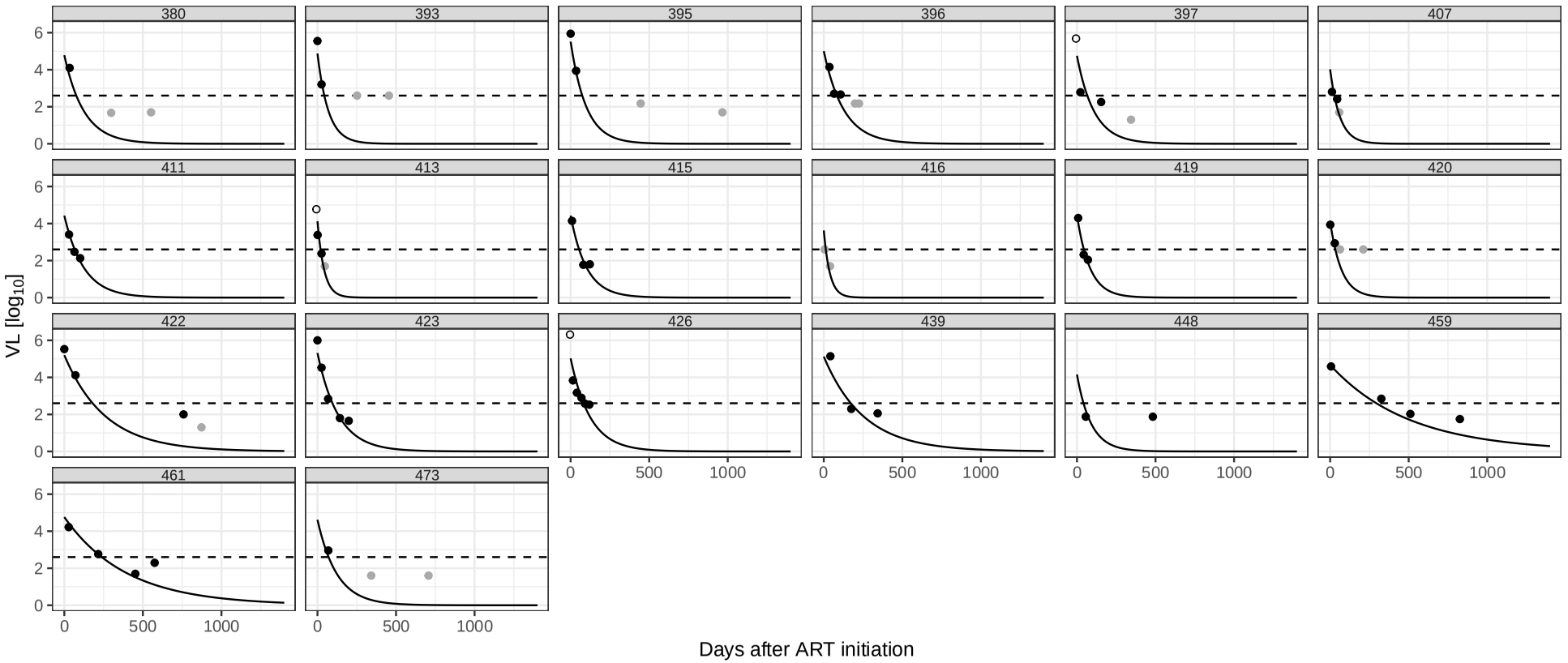

Figure S2: Non-linear mixed effect model fits "clean" VL decay of 188 infants. Each panel represents a different infant labelled with its ID. Dots represent VL measurements: black dots are exact measurements; grey dots are censored and below or above the RNA-assay detection threshold. Open circles indicated that the baseline measurements are extrapolated from the closest measurements within 10 days prior to ART initiation. The solid black lines represent the model fit and the horizontal dashed line marks the threshold criteria for VL suppression (400 RNA copies/ml).

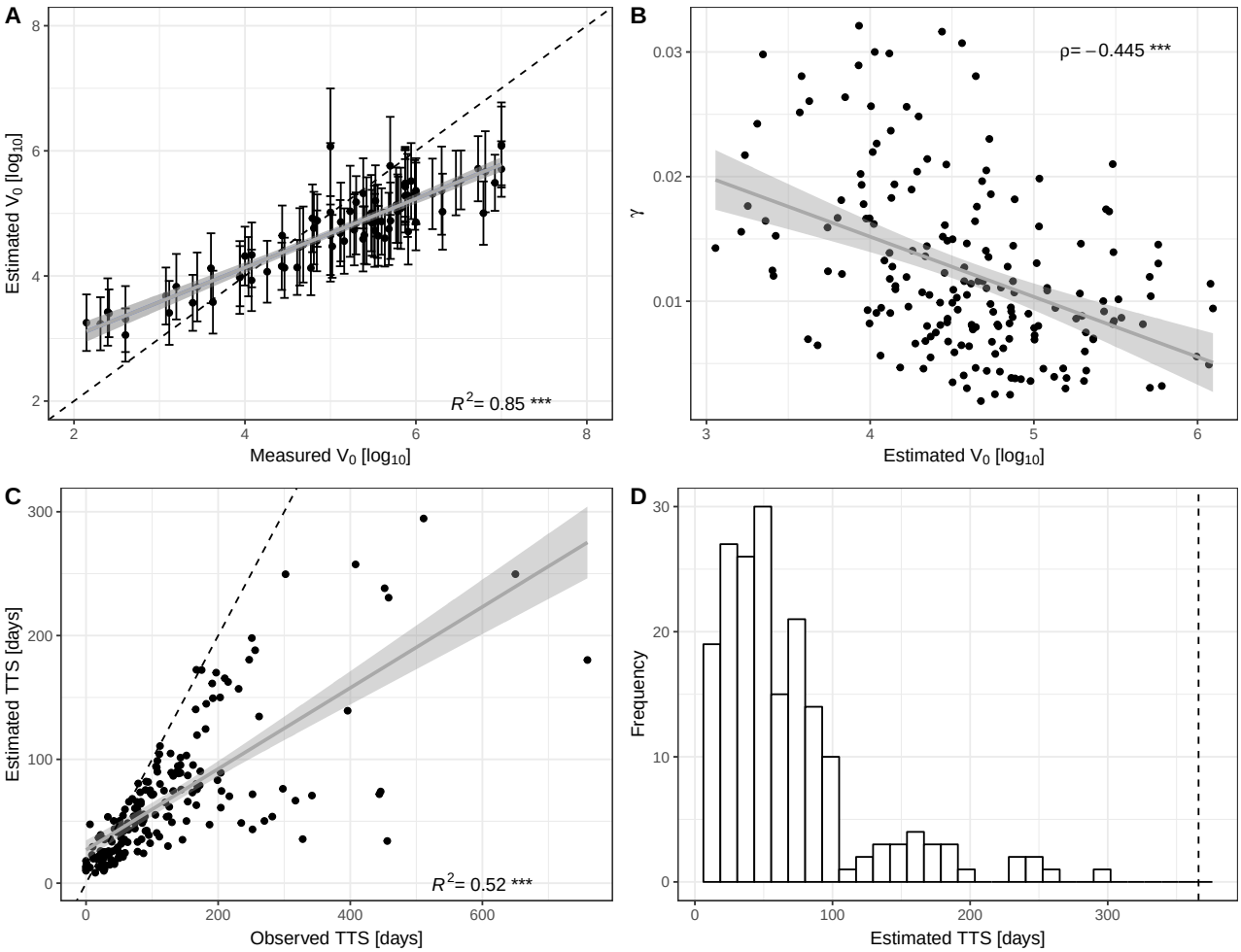

Figure S3: Estimated TTS of "clean" mVL decays is shorter than observed TTS. Sensitivity check of model parameters: Correlation plots between (A) measured and mean estimated baseline viral load V_0 and (C) observed and predicted time to viral suppression (TTS) are shown. The dashed lines present the diagonal. The linear regression lines and the 95% confidence intervals are shown in grey. We performed a Pearson correlation test and the R^2 are given (***, p-value $<$ 0.001). In (A) the error bars represent the standard derivation of the estimated V_0. In (B) the correlation between the mean estimated V_0 and the slope parameter γ is shown. Spearman's correlation coefficient ρ is given (***, p-value $<$ 0.001). (D) shows the distribution of the estimated times to viral suppression (TTS) in a histogram. The dashed line represents one year.

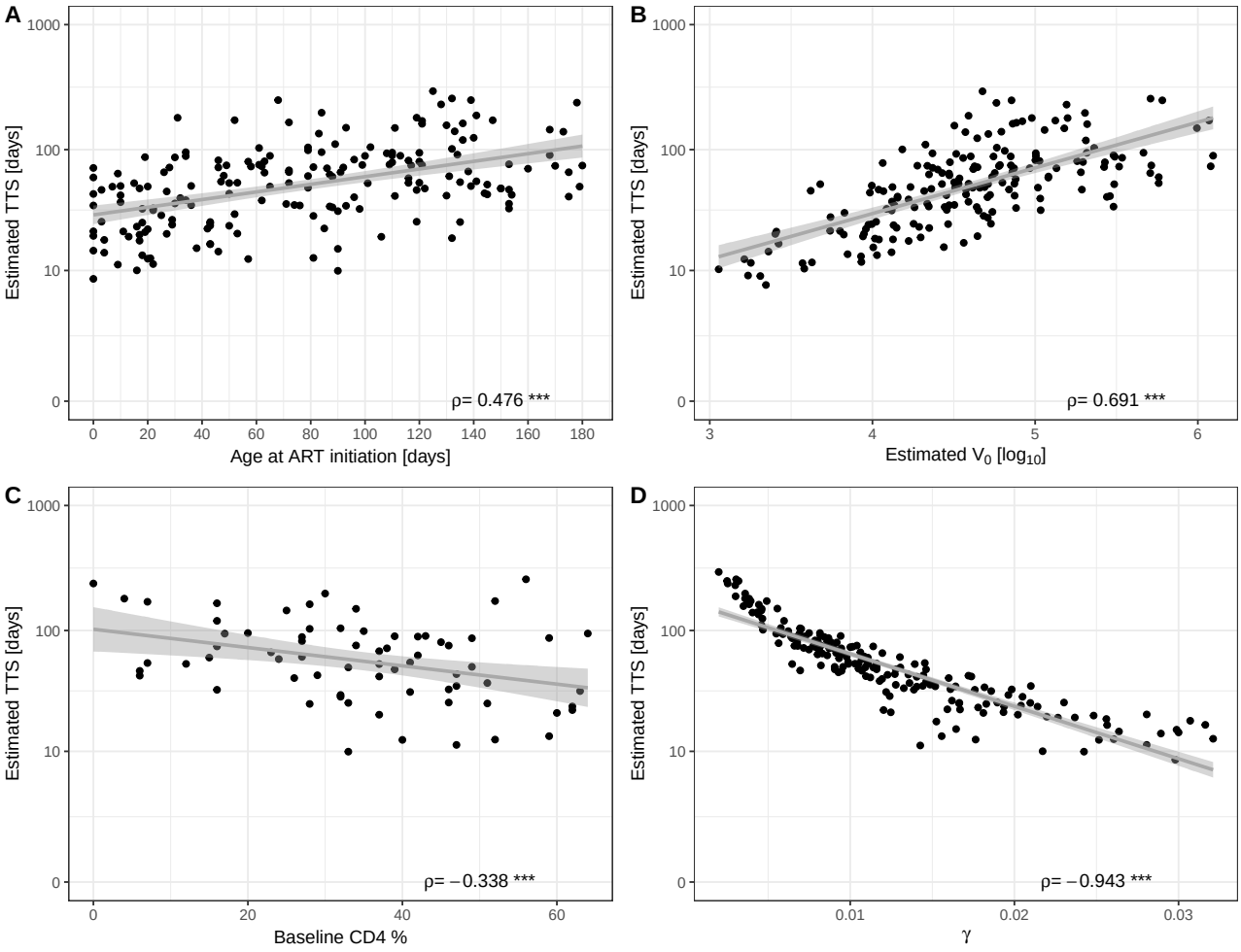

Figure S4: TTS correlates with baseline measurements and model parameters. Plots show estimated time to viral suppression (TTS) as a function of (A) age at ART initiation, (B) mean estimated baseline viral load V_0, (C) measured baseline CD4% at ART initiation, and (D) the slope parameter γ. The linear regression lines with their 95% confidence intervals are shown in grey. Spearman's correlation tests were performed and correlation coefficients ρ are given (***, p-value < 0.001).

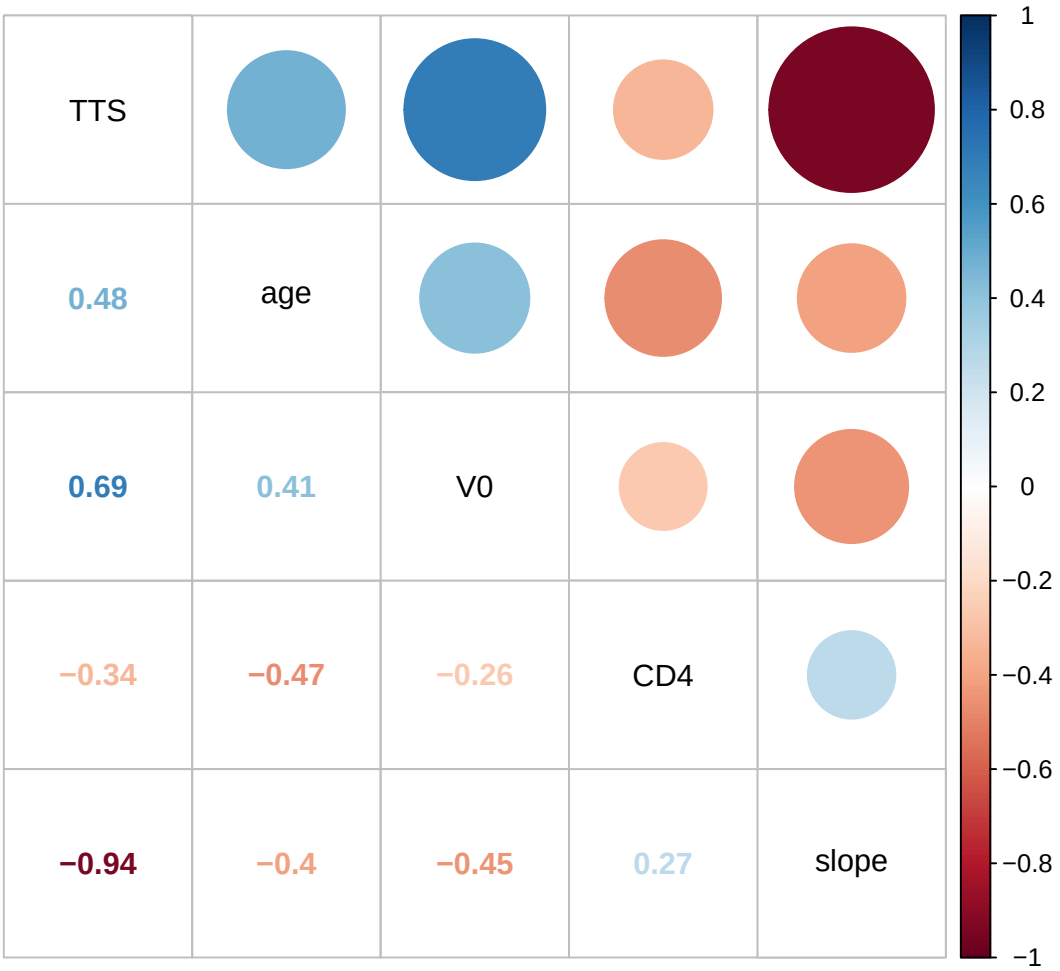

Figure S5: Parameters determining TTS highly intercorrelate. Correlation matrix of time to viral suppression (TTS), age at ART initiation, estimated baseline V_0, estimated slope parameter γ and measured baseline CD4%. We performed Spearman's correlation tests, the correlation coefficients ρ are given in the lower triangular. The strengths of the correlation are represented by the size of the circle and their colour intensity in the upper triangular. A negative correlation is shown in red, a positive correlation is shown in blue. All correlations have a p-values < 0.05.

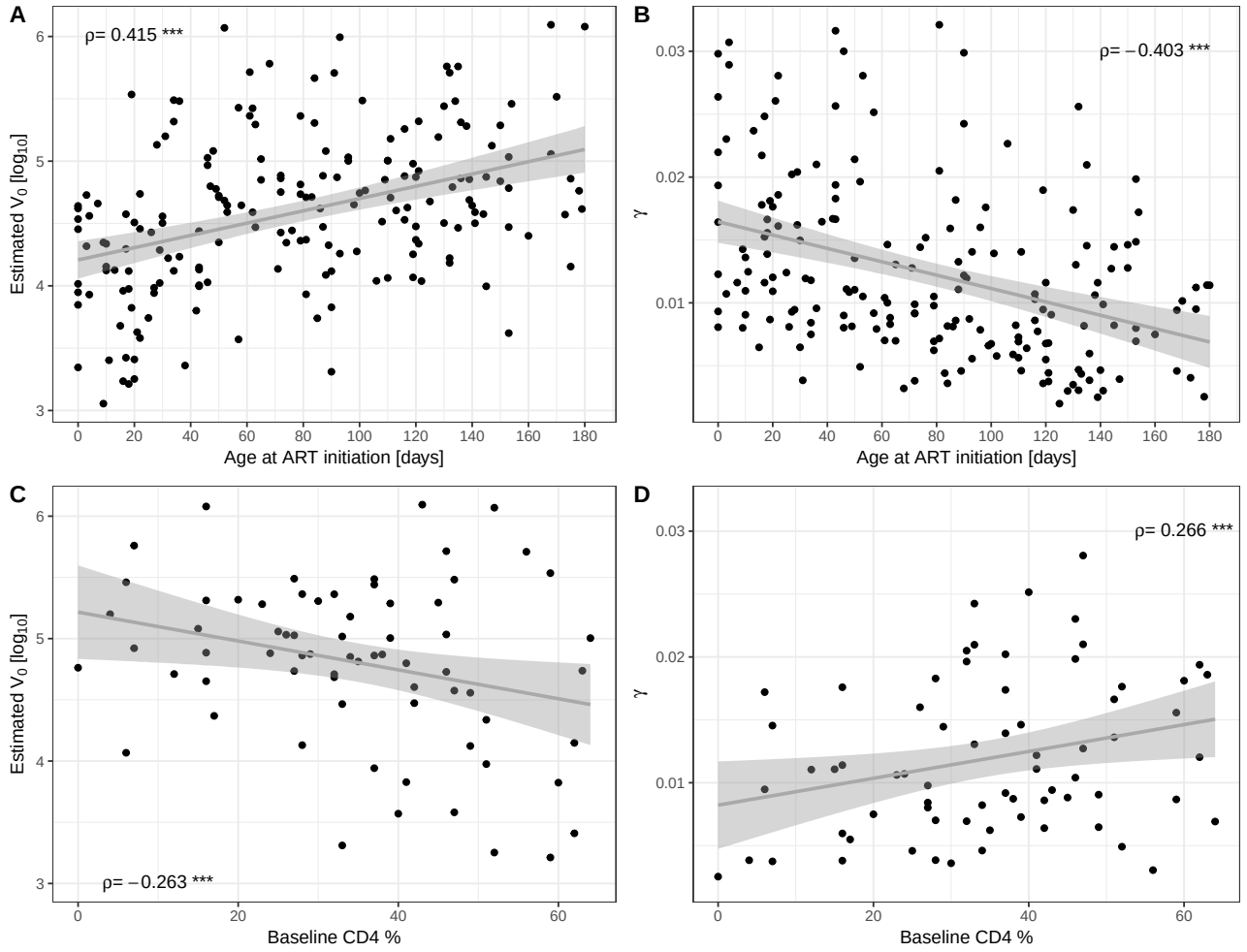

Figure S6: Parameters associated with TTS highly intercorrelate. Panel (A) shows mean estimated V_0 and (B) shows the slope parameter γ for each infant against age at ART initiation. The correlation of measured baseline CD4% with mean estimated V0 is shown in (C) and with slope parameter γ is shown in (D). The linear regression lines with their 95% confidence interval are shown in grey. Spearman's correlation tests were performed and correlation coefficients ρ are given (***, p-value < 0.001).

APPENDIX

The EPPICC 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 Ołdakowska, 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. 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).
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Sweden: Karolinska Institutet and University Hospital, Stockholm (Lars Naver, Sandra Soeria-Atmadja, Vendela Hagås).

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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.
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