

Supplemental Digital Content

Country	Reference(s)
Angola	[1]
Botswana	[2]
Burkina Faso	[2, 3]
Burundi	[4]
Cameroon	[2, 5-8]
CAR	[2, 9]
Chad	[8]
Congo	[2]
Congo DR	[4]
Cote d'Ivoire	[10]
Djibouti	[11]
Ethiopia	[2, 12]
Gabon	[8, 13, 14]
Ghana	[2, 15]
Kenya	[2, 12, 16-18]
Malawi	[2]
Mali	[19, 20]
Mozambique	[2, 21]
Niger	[8]
Nigeria	[2, 22, 23]
Rwanda	[24]
Senegal	[2]
South Africa	[2, 25-28]
Sudan	[29]
Swaziland	[2]
Tanzania	[2, 30]
Togo	[31]
Uganda	[2, 32]
Zambia	[2, 33]
Zimbabwe	[2]

Table S1. Sources of subtype and recombinant data used for each country

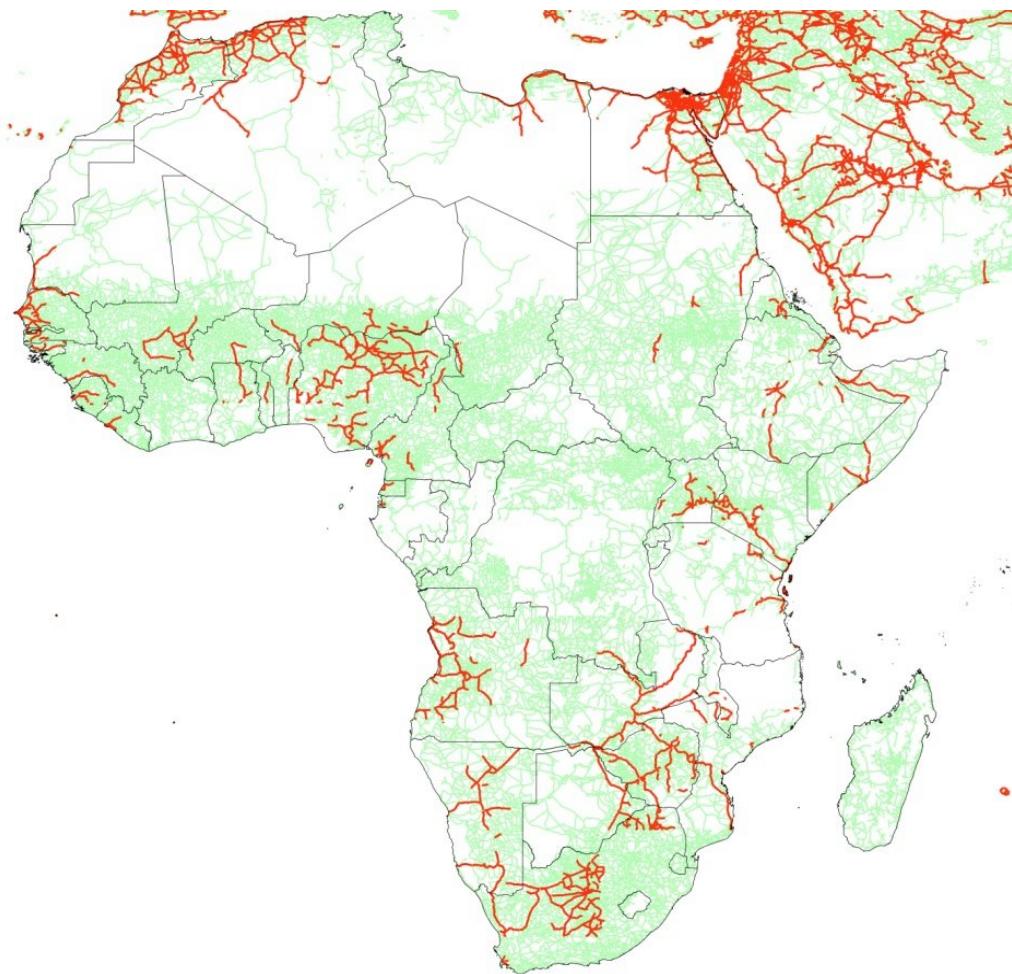


Fig. S1. Primary (red) and secondary (green) roads in Africa, as defined by the VMap0 dataset

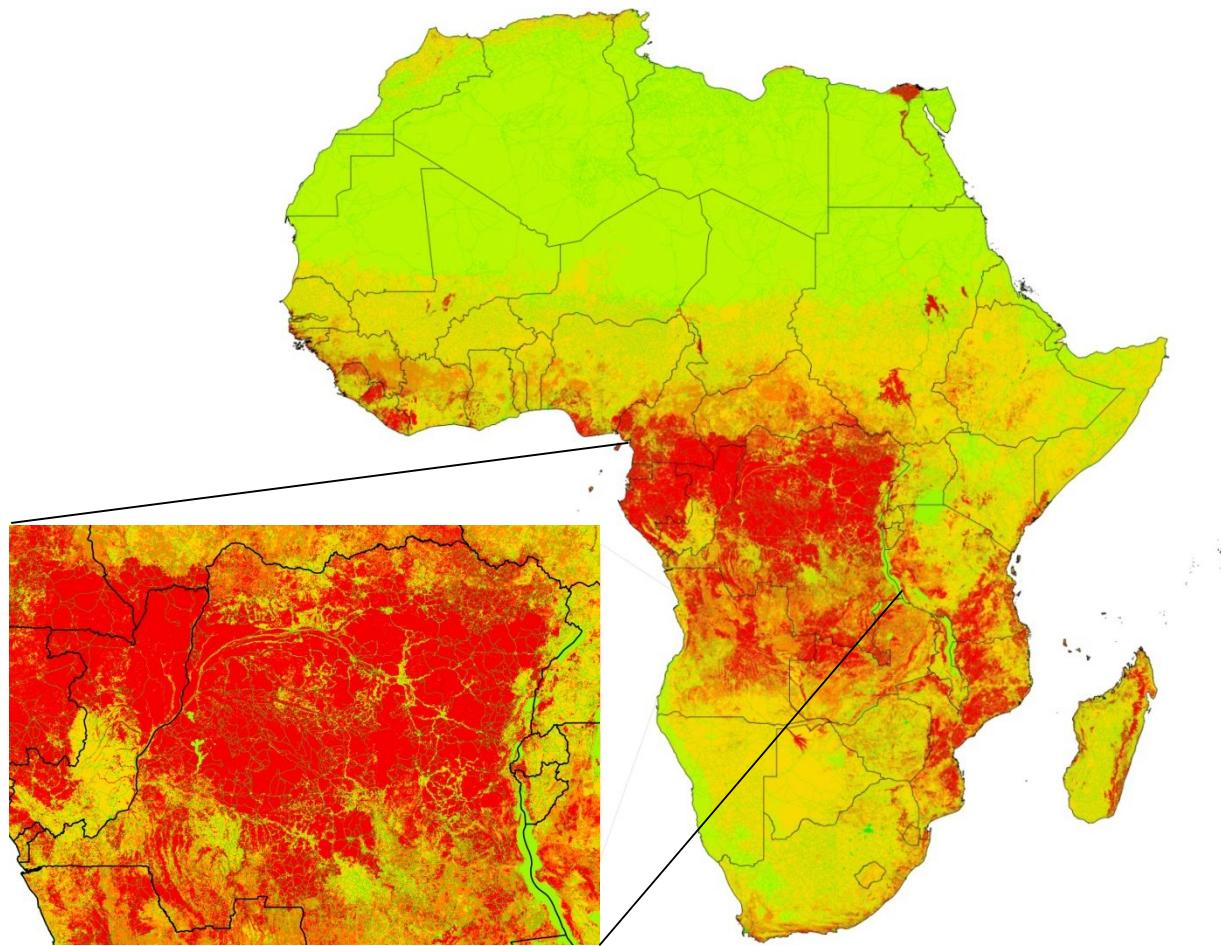


Fig. S2. Africa land surface friction map, showing friction levels on a continuous scale from low in green, through moderate in yellow, to high in orange and red. The inset shows details for a region of central Africa, including much of the Democratic Republic of Congo.

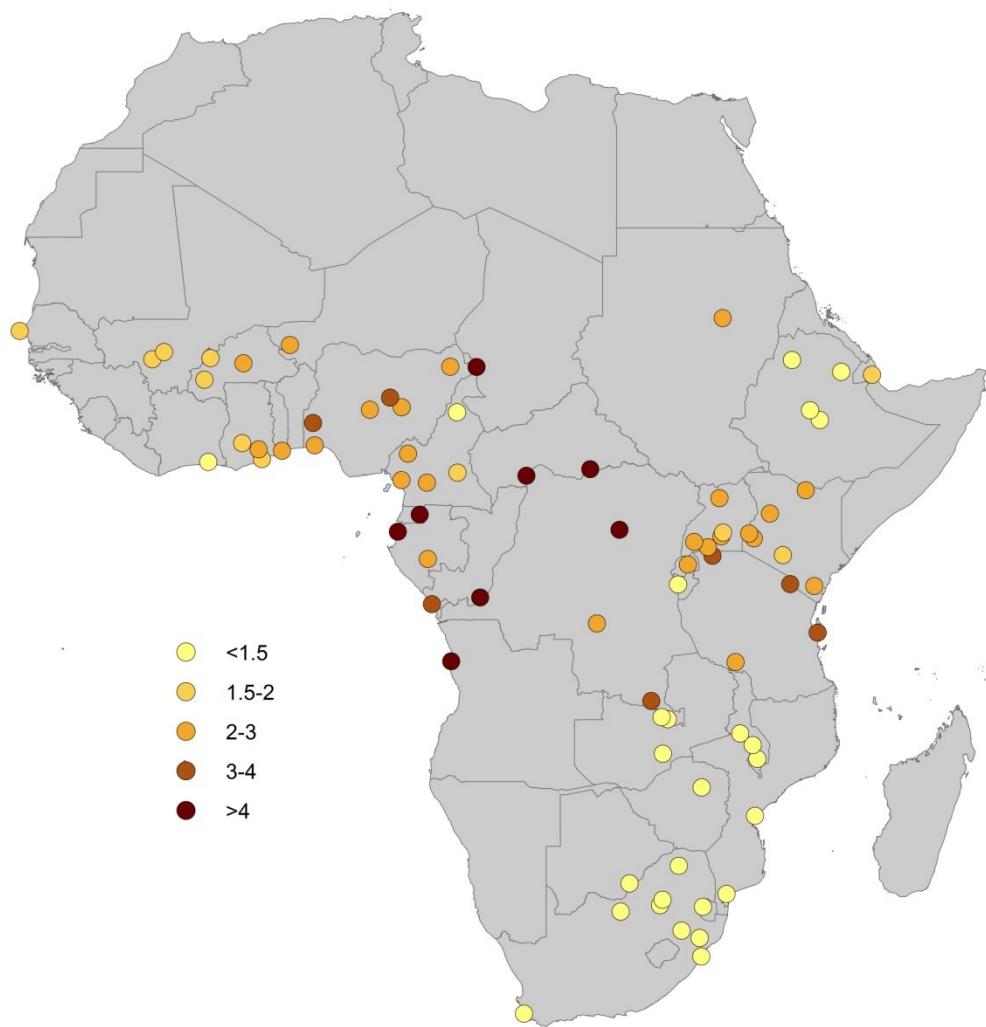


Fig. S3. Inverse Simpson diversity index [34] values for each sample location. Low values indicate low diversity in subtypes found, while high values indicate substantial diversity.

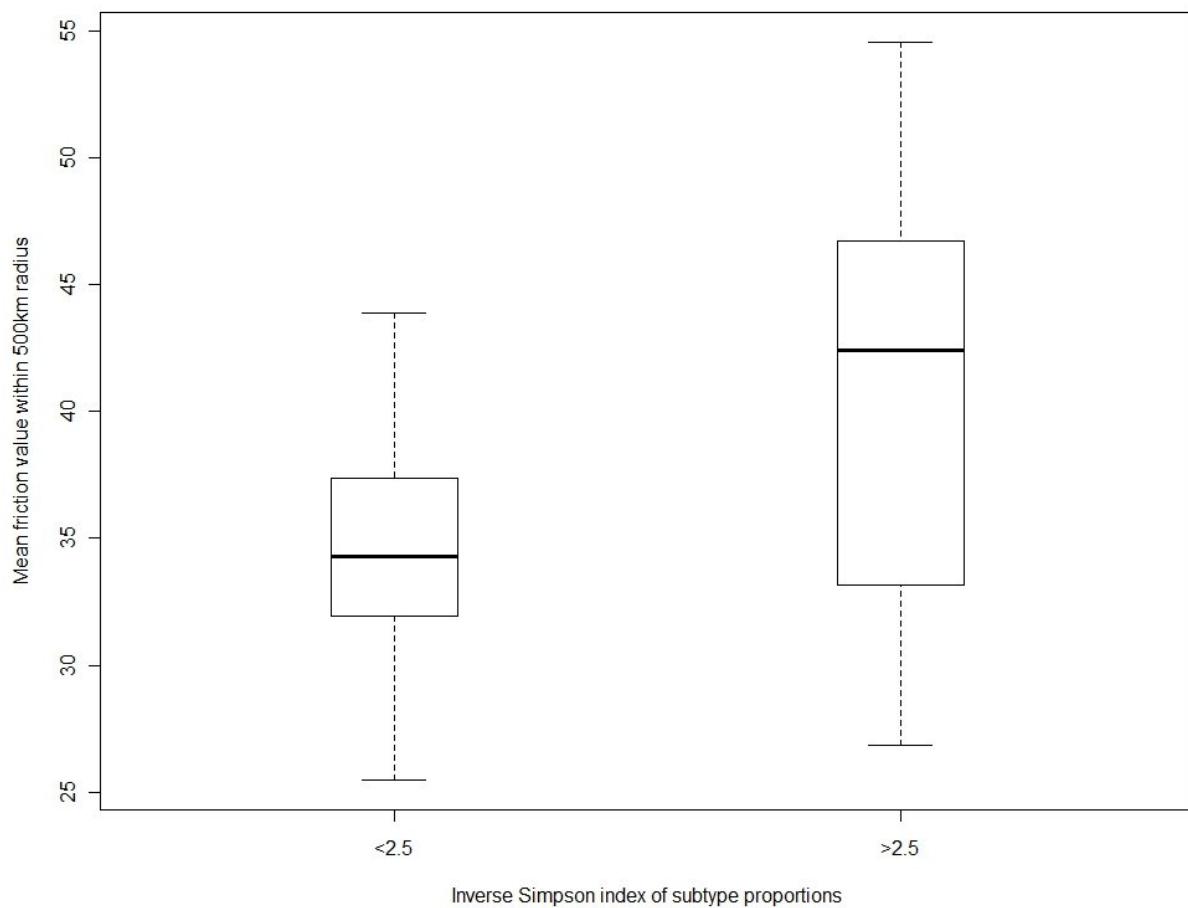


Fig. S4. Boxplot showing the difference in mean friction values within a 500km radius of each sample location (Fig. S2 shows the friction map) by low and high subtype diversity, measured using the Simpson diversity index [34]. The Mann-Whitney U-test shows that these differences are significant ($W=331$, $p=0.0042$).

References

1. Garrido C, Zahonero N, Fernandes D, Serrano D, Silva AR, Ferraria N, Antunes F, Gonzalez-Lahoz J, Soriano V, de Mendoza C: **Subtype variability, virological response and drug resistance assessed on dried blood spots collected from HIV patients on antiretroviral therapy in Angola.** *J Antimicrob Chemother* 2008, **61**:694-698.
2. Hemelaar J, Gouws E, Ghys PD, Osmanov S: **Global trends in molecular epidemiology of HIV-1 during 2000-2007.** *AIDS* 2011, **25**:679-689.
3. Tebit DM, Sangare L, Makamtse A, Yameogo S, Somlare H, Bado G, Kouadio BG, Sathiandee K, Tiba F, Sanou I, et al: **HIV drug resistance pattern among HAART-exposed patients with suboptimal virological response in Ouagadougou, Burkina Faso.** *J Acquir Immune Defic Syndr* 2008, **49**:17-25.
4. Vidal N, Mulanga C, Bazepeo SE, Mwamba JK, Tshimpaka JW, Kashi M, Mama N, Laurent C, Lepira F, Delaporte E, Peeters M: **Distribution of HIV-1 variants in the Democratic Republic of Congo suggests increase of subtype C in Kinshasa between 1997 and 2002.** *J Acquir Immune Defic Syndr* 2005, **40**:456-462.
5. Ndembı N, Abraha A, Pilch H, Ichimura H, Mbanya D, Kaptue L, Salata R, Arts EJ: **Molecular characterization of human immunodeficiency virus type 1 (HIV-1) and HIV-2 in Yaounde, Cameroon: evidence of major drug resistance mutations in newly diagnosed patients infected with subtypes other than subtype B.** *J Clin Microbiol* 2008, **46**:177-184.
6. Ndembı N, Lyagoba F, Nanteza B, Kushemererwa G, Serwanga J, Katongole-Mbidde E, Grosskurth H, Kaleebu P: **Transmitted antiretroviral drug resistance surveillance among newly HIV type 1-diagnosed women attending an antenatal clinic in Entebbe, Uganda.** *AIDS Res Hum Retroviruses* 2008, **24**:889-895.
7. Ndembı N, Takehisa J, Zekeng L, Kobayashi E, Ngansop C, Songok EM, Kageyama S, Takemura T, Ido E, Hayami M, et al: **Genetic diversity of HIV type 1 in rural eastern Cameroon.** *J Acquir Immune Defic Syndr* 2004, **37**:1641-1650.
8. Peeters M, Toure-Kane C, Nkengasong JN: **Genetic diversity of HIV in Africa: impact on diagnosis, treatment, vaccine development and trials.** *AIDS* 2003, **17**:2547-2560.
9. Punzi G, Saracino A, Brindicci G, Scarabaggio T, Lagioia A, Angarano G, Monno L: **HIV infection and protease genetic diversity in a rural area of the Southern Central African Republic.** *J Med Virol* 2005, **77**:457-459.
10. Toni T, Masquelier B, Bonard D, Faure M, Huet C, Caumont A, Roques P, Dabis F, Salamon R, Fleury H: **Primary HIV-1 drug resistance in Abidjan (Côte d'Ivoire): a genotypic and phenotypic study.** *AIDS* 2002, **16**:488-491.
11. Maslin J, Rogier C, Berger F, Khamil MA, Mattera D, Grandadam M, Caron M, Nicand E: **Epidemiology and genetic characterization of HIV-1 isolates in the general population of Djibouti (Horn of Africa).** *J Acquir Immune Defic Syndr* 2005, **39**:129-132.
12. Khamadi SA, Ochieng W, Lihana RW, Kinyua J, Muriuki J, Mwangi J, Lwembe R, Kiptoo M, Osman S, Lagat N, et al: **HIV type 1 subtypes in circulation in northern Kenya.** *AIDS Res Hum Retroviruses* 2005, **21**:810-814.
13. Caron M, Makuwa M, Souquiere S, Descamps D, Brun-Vezinet F, Kazanjii M: **Human immunodeficiency virus type 1 seroprevalence and antiretroviral drug resistance-associated mutations in miners in Gabon, central Africa.** *AIDS Res Hum Retroviruses* 2008, **24**:1225-1228.

14. Mintsa-Ndong A, Caron M, Plantier JC, Makuwa M, Le Hello S, Courgaud V, Roques P, Kazanji M: **High HIV Type 1 prevalence and wide genetic diversity with dominance of recombinant strains but low level of antiretroviral drug-resistance mutations in untreated patients in northeast Gabon, Central Africa.** *AIDS Res Hum Retroviruses* 2009, **25**:411-418.
15. Sagoe KW, Dwidar M, Lartey M, Boamah I, Agyei AA, Hayford AA, Mingle JA, Arens MQ: **Variability of the human immunodeficiency virus type 1 polymerase gene from treatment naive patients in Accra, Ghana.** *J Clin Virol* 2007, **40**:163-167.
16. Land AM, Luo M, Pilon R, Sandstrom P, Embree J, Wachihi C, Kimani J, Plummer FA, Ball TB: **High prevalence of genetically similar HIV-1 recombinants among infected sex workers in Nairobi, Kenya.** *AIDS Res Hum Retroviruses* 2008, **24**:1455-1460.
17. Lihana RW, Khamadi SA, Lubano K, Lwembe R, Kiptoo MK, Lagat N, Kinyua JG, Okoth FA, Songok EM, Makokha EP, Ichimura H: **HIV type 1 subtype diversity and drug resistance among HIV type 1-infected Kenyan patients initiating antiretroviral therapy.** *AIDS Res Hum Retroviruses* 2009, **25**:1211-1217.
18. Yang C, Li M, Shi YP, Winter J, van Eijk AM, Ayisi J, Hu DJ, Steketee R, Nahlen BL, Lal RB: **Genetic diversity and high proportion of intersubtype recombinants among HIV type 1-infected pregnant women in Kisumu, western Kenya.** *AIDS Res Hum Retroviruses* 2004, **20**:565-574.
19. Derache A, Maiga AI, Traore O, Akonde A, Cisse M, Jarrousse B, Koita V, Diarra B, Carcelain G, Barin F, et al: **Evolution of genetic diversity and drug resistance mutations in HIV-1 among untreated patients from Mali between 2005 and 2006.** *J Antimicrob Chemother* 2008, **62**:456-463.
20. Imamichi H, Koita O, Dabitao D, Dao S, Ibrah M, Sogoba D, Dewar RL, Berg SC, Jiang MK, Parta M, et al: **Identification and characterization of CRF02_AG, CRF06_cpx, and CRF09_cpx recombinant subtypes in Mali, West Africa.** *AIDS Res Hum Retroviruses* 2009, **25**:45-55.
21. Lahuerta M, Aparicio E, Bardaji A, Marco S, Sacarlal J, Mandomando I, Alonso P, Martinez MA, Menendez C, Naniche D: **Rapid spread and genetic diversification of HIV type 1 subtype C in a rural area of southern Mozambique.** *AIDS Res Hum Retroviruses* 2008, **24**:327-335.
22. Agwale SM, Zeh C, Robbins KE, Odama L, Saekhou A, Edubio A, Njoku M, Sani-Gwarzo N, Gboun MS, Gao F, et al: **Molecular surveillance of HIV-1 field strains in Nigeria in preparation for vaccine trials.** *Vaccine* 2002, **20**:2131-2139.
23. Ojesina AI, Mullins C, Imade G, Samuels J, Sankale JL, Pam S, Sagay S, Idoko J, Kanki PJ: **Characterization of HIV type 1 reverse transcriptase mutations in infants infected by mothers who received peripartum nevirapine prophylaxis in Jos, Nigeria.** *AIDS Res Hum Retroviruses* 2007, **23**:1587-1592.
24. Servais J, Lambert C, Karita E, Vanhove D, Fischer A, Baurith T, Schmit JC, Schneider F, Hemmer R, Arendt V: **HIV type 1 pol gene diversity and archived nevirapine resistance mutation in pregnant women in Rwanda.** *AIDS Res Hum Retroviruses* 2004, **20**:279-283.
25. Bessong PO, Larry Obi C, Cilliers T, Choge I, Phoswa M, Pillay C, Papathanasopoulos M, Morris L: **Characterization of human immunodeficiency virus type 1 from a previously unexplored region of South Africa with a high HIV prevalence.** *AIDS Res Hum Retroviruses* 2005, **21**:103-109.
26. Jacobs GB, Laten A, van Rensburg EJ, Bodem J, Weissbrich B, Rethwilm A, Preiser W, Engelbrecht S: **Phylogenetic diversity and low level antiretroviral resistance mutations in HIV type 1 treatment-naive patients from Cape Town, South Africa.** *AIDS Res Hum Retroviruses* 2008, **24**:1009-1012.
27. Jacobs GB, Nistal M, Laten A, van Rensburg EJ, Rethwilm A, Preiser W, Bodem J, Engelbrecht S: **Molecular analysis of HIV type 1 vif sequences from Cape Town, South Africa.** *AIDS Res Hum Retroviruses* 2008, **24**:991-994.

28. Romani B, Glashoff R, Engelbrecht S: **Molecular and phylogenetic analysis of HIV type 1 vpr sequences of South African strains.** *AIDS Res Hum Retroviruses* 2009, **25**:357-362.
29. Hierholzer M, Graham RR, El Khidir I, Tasker S, Darwish M, Chapman GD, Fagbami AH, Soliman A, Birx DL, McCutchan F, Carr JK: **HIV type 1 strains from East and West Africa are intermixed in Sudan.** *AIDS Res Hum Retroviruses* 2002, **18**:1163-1166.
30. Nyombi BM, Holm-Hansen C, Kristiansen KI, Bjune G, Muller F: **Prevalence of reverse transcriptase and protease mutations associated with antiretroviral drug resistance among drug-naive HIV-1 infected pregnant women in Kagera and Kilimanjaro regions, Tanzania.** *AIDS Res Ther* 2008, **5**:13.
31. Yaotse DA, Nicole V, Roch NF, Mireille PD, Eric D, Martine P: **Genetic characterization of HIV-1 strains in Togo reveals a high genetic complexity and genotypic drug-resistance mutations in ARV naive patients.** *Infect Genet Evol* 2009, **9**:646-652.
32. Gale CV, Yirrell DL, Campbell E, Van der Paal L, Grosskurth H, Kaleebu P: **Genotypic variation in the pol gene of HIV type 1 in an antiretroviral treatment-naive population in rural southwestern Uganda.** *AIDS Res Hum Retroviruses* 2006, **22**:985-992.
33. Handema R, Terunuma H, Kasolo F, Kasai H, Sichone M, Mulundu G, Deng X, Ichiyama K, Mitarai S, Honda M, et al: **Emergence of new HIV-1 subtypes other than Subtype C among antenatal women in Lusaka, Zambia.** *AIDS Res Hum Retroviruses* 2001, **17**:759-763.
34. Simpson EH: **Measurement of diversity.** *Nature* 1949, **163**:688.