REAL Satellite Data: Nighttime Light Intensity Annual Urbanization Growth Rate VIIRS DNB Monthly Composites (2012-2023) (VIIRS Satellite Data) 8.6% 17.5 8 15.0 6 Annual Growth Rate (%) 5.0 0 2.5 -2 Abidjan -2.6% Johannesburg 1980 1990 2000 2010 2020 Abidjan Johannesburg Year **Seasonal Light Patterns** (Multi-year Satellite Average) -- Abidjan SATELLITE-CONFIRMED URBANIZATION 16 Johannesburg Google Earth Engine + VIIRS Data ABIDJAN (Côte d'Ivoire): • 9,162 study participants • Period: 2014-2023 • Light increase: +110.5% • Peak: 7.56 nW/cm²/sr 14 Mean Radiance (nW/cm²/sr) 8 0 t • Observations: 120 monthly JOHANNESBURG (South Africa): • 11,800 study participants • Period: 2014-2023 • Light increase: -21.1% • Peak: 18.16 nW/cm²/sr • Observations: 120 monthly EVIDENCE FOR HEALTH STUDIES: ✓ Real-time environmental change ✓ Quantified urbanization rates ✓ Infrastructure development ✓ Population density changes ✓ Economic activity growth 6 Data Source: NOAA VIIRS DNB Resolution: 500m, Monthly Quality: Weather-filtered 4

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