Inhaled gas imaging techniques have been used for investigating ventilation distribution. Does the tracer concentration distribution accurately reflect the ventilation distribution? I simulated intra-pulmonary distribution of inhaled gas by the use of computational fluid dynamics with Kitaoka's 4D lung model. The simulation results suggested that the concentration distribution of inhaled gas tracer did not quantitatively reflect ventilation distribution. Although the tracer imaging technique is useful for basic investigation of respiratory physiology, clinical evaluation of the ventilation distribution should be directly obtained by image-based motion analysis technique.