Spoke 2 - Connecting patients and therapists through adaptive environments and intelligent sensors to enhance proximity medicine			
Innovative sensors, devices and digital tools to early evaluate and treat environmental, lifestyle factors and pathological phenomena in frail and chronic populations.			
Leader	UNIMIB	Affiliates	UNIBG, UNICAL, ASST PG23, ART, ATS MI, ASST BGEST, FERB, ASST MONZA

Pilot 2.1 Remote physical therapy and sensorized environments (UNIBG, UNIMIB, ASST PG23). Development of innovative solutions for rehabilitation using medical sensors, VR and smart assistive devices that will be developed and employed. Automatic generation of medical information by using raw sensor data and AI modules ad-hoc developed for each specific use case involved in the project. (**Pathology**).

Pilot 2.2 Epidemiological study of cardiovascular diseases in a mountain area (UNIBG, UNIMIB, ASST PG23, ATS MI). Development of e-technologies for long-term control of cardiovascular risk factors and investigation of the link between those risk factors and future incidence of cardiovascular diseases (**Pathology**).

Pilot 2.3 Smart wearable and portable sensors to monitor human healthiness and pathological states (UNIMIB, UNIBG, ATS MI). Development of cutting-edge technologies, devices and solutions to accelerate the adoption of proximity medicine, focusing on diagnosis, monitoring and treatment of chronic and frail patients. Integration of patients' motion/interactions and biological outputs. Innovative wearable, transdermal, implantable, and portable sensors will be developed and integrated with modular web-based platforms to elaborate data for each specific application (**Territorial**).

Pilot 2.4 Wide spectrum light and devices to sanitise surfaces and air (UNIMIB, ART, ASST MONZA). Development of devices and tools based on wide spectrum light for air flow sanitation and surface disinfection. The systematic assessment of the sanitation and disinfection capabilities of the different techniques and an online monitoring platform will be designed, built and tested in operative environments (**Territorial**).

Pilot 2.5 Development of nanosensors for the detection of pathogens and biohazards (UNIMIB). Development of proximity care advanced nanosensors for the detection of pathogens and biohazards to monitor patients and their living environment (i.e. home, PoC, medical centres). A baseline analysis of the macro- and micro-environments will be performed to define biological and physico-chemical variables associated with increased health risk and to monitor skin microbiota perturbations with an integrated approach. Nanosensors and related data for the detection of pathogens and biohazards with other detectable risks will be developed and assessed based on the analyses of human body fluids and skin physico-chemical parameters (**Territorial**).

Pilot 2.6 Remote monitoring of groups and community (UNICAL, UNIMIB). Development of an effective controlling system exploiting consumer technologies for monitoring patients along the entire pathology life cycle and before extensive use of hospital facilities. The system will be designed and updated by adding specific functionalities for remote monitoring and controlling of both ill and healthy people. The system will be used to monitor residents of remote locations with logistics problems to access healthcare facilities (**Territorial**).

Pilot 2.7 Wearable devices for remote monitoring of Parkinson's disease and frail patients (UNIBG, ASST BGEST, FERB, ASST MONZA) Development of remote-monitoring system for Parkinson's and frail patients including sensors for daily quantification of neurological motor symptoms and data management system for healthcare professionals to early detect and timely respond to neurological health threats (**Pathology**).