Corona like Other Biological Infection

[a]Anand Shukla, [b]Surabhi Gupta, [c]Rajeev Ranjan Sharma
[a]Prof. Ex. Fiji university, India
[b]Prof. (SVSU), India
[c]Assist. Prof. (SVSU) Subharti International Medical College, Meerut. UP (India)

Abstract

Bio Terrorism Is Attack Of Biological Agents Like Virus, Bacteria And Other Germs To Cause And Spread Illness Disease And Death Of Peoples. They Generally Attack Our Big Cities And Effect Of Biological Agents Are Not Detected Because They Spread In Longer Time And Very Difficult To Identify. The Aim Of Bio- Terrorist Is To Create Panic And Spread Fatal Disease That Causes Haemorrhagic Fever, GIT Disorder And Lead To Death Like Covid-19, H1 N1 Influenza, Small Pox, Chickengunia, Anthrax, Etc. The Preparedness Of Bio- Terrorist Attack And Prevention And Treatment Is Required With Indigenous System, Antibiotics, Vaccines And Trend Health Personals.

KEYWORDS: Biological Agents, Indigenous Agents, Syndromes Surveillance, Vaccines And Antibiotic.

Introduction

A *Bioterrorism Attack* Is The Deliberate Release Of Viruses, Bacteria, Or Other Germs (Agents) Used To Cause Illness Or Death In Animals, Or Plants.These Agents Are Typically Found In Nature, But It Is Possible That They Could Be Changed To Increase Their Ability To Cause Disease, Make Them Resistant To Current Medicines, Or To Increase Their Ability To Be Spread Into The Environment. Biological Agents Can Be Spread Through The Air, Water, Or Food .Terrorists May Use Biological Agents Because They Can Be Extremely Difficult To Detect And Do Not Cause Illness For Several Hours To Several Days. Some Bioterrorism Agents, Like The Smallpox Virus, Can Be Spread From Person To Person And Some, Like Anthrax, Can Not . In Bio- Terrorist Attacks, Only A Small Number Of People May Be Injured, But Many More Become Afraid And Change Their Behavior Because Of Their Fear. The R&D Needs And Recommendations Presented Here May Seem To Be Simple At The First Glance, But They Are Loaded With Prescription For Extensive And Expensive Work, On Several Fronts Simultaneously And Each One Of The 18 Statements Requires An Elaborate Explanation, To Put It Into Action. They Would Do A Lot Of Good To Gear Up The Potential Of A Country To Manage Disease In Its Day-To-Day Occurrence And Prepare As Never Before To Face Natural Calamities Such As Cyclones, Floods And Earthquakes, Which Epidemics Follow In The Wake.

India Is Among The Most Vulnerable Countries That Run The Risk Of Facing Threats Of Bio-Terrorism. A Lot Of R&D And Groundwork Has To Be Planned And Carried Out Speedily, For The Vulnerable Countries To Offer Even A Semblance Of Fight Against Bio-Terrorism. In The Current Absence Of

Awareness And Preparedness, We Need To Examine What The Developed World Has Been Doing To Face Bio-Terrorism.

Nature Of Problem

There Are Practical Difficulties. Stockpiling Antibiotics And Other Drugs, Against All The Potential Weapons Of Bio-Terrorism, In Quantities Adequate To Protect The Susceptible Human Populations And Livestock, Is An Unimaginably Immense And Nearly Impossible Task, Not To Speak Of The Expenditure Involved, Even In The Developed Countries. 'How Much And Of What?' Is A Question That Cannot Be Answered With Confidence. In Countries Like India And China, The Indigenous Systems Of Medicine Have A Number Of Plant Based Drugs Effective Against Several Infectious Diseases That Can Be A Means Of Bio-Terrorism. For Many There Are Clinical Data In Support Of Their Efficacy. A Lot Of Damage Can Be Contained If The Probable Diseases Are Identified And The Precautionary And Remedial Measures From The Indigenous Systems Of Medicine Are Publicised. For Example, The Yellow Sheets In The Pomegranate Fruit (Other Than The Outer Leathery Covering And The Seeds) Contain A Principle That Is Effective Against A Broad Range Of Gastrointestinal Pathogens, Including The Cholera Bacterium. Dried And Powdered, This Material Is Traditionally Administered In Buttermilk Or Even Water, To Control Diarrhoeal Infections.Oral Rehydration Solution That Saves The Lives Of Millions Of Children Suffering From Diarrhoea Can Also Prevent Dehydration In Adults. Countries That Cannot Afford Modern Approaches, In Terms Of The Expertise, Infrastructure, Time And Money Involved, Better Find Solution To The Problem, From Within The Local Tradition. The Models Of Research And Defence Measures Of The Advanced Countries Cannot Be Directly Imported Into The Developing Countries, As The Strains Of Pathogens, Their Severity, The Susceptibility Of The Populations To A Particular Disease, And The Affordability Of The Costs Involved, Are All Different. In The Efforts Of Each Country To Develop Her Own Defences, Indigenous Systems Of Medicine Come In Here Very Handy. The Advantages Of Indigenous Systems Are Accessibility, Economic Viability And Reasonable Effectiveness, In Terms Of Both Prevention And Management Of Infectious Diseases, With A Local Import.

HISTORY

YEAR	HISTORY OF BIO-TERRORISM
1763	Captain Ecuyer Of The Royal Americans, Under The Guise Of Friendship, Presents To The Native Americans Two Blankets And A Handkerchief Contaminated With Smallpox.
1767	During The French And Indian War, The English General, Sir Jeffrey Amherst, Gives Blankets Laced With Smallpox To Indians Loyal To The French. The Epidemic Decimates The Tribes, Arguably, Resulting In A Successful British Attack On Ft. Carillon.
1940	On October 29, Plague Is Dropped By Japanese Planes At Ninpo, Causing 99 Deaths.

1975-1983	The Countries Of Laos And Kampuchea Come Under Attack By Planes And Helicopters That Deliver Multi-Colored Aerosols ("Yellow Rain") Over The Population. Both Man And Animal Are Affected And Some Die. There Is No Definitive Evidence That These Aerosol Attacks Were Examples Of Biological Warfare, But There Is A Belief Among Many That, At Least Some Of These Attacks, Involved T-2 Mycotoxins.
1983	It Has Been Reported That Osama Bin Laden Has Attempted To Acquire Biological Weapons In Sudan And Afghanistan.
10/14/2001	An Aide To Majority Leader Senator Tom Daschle Opens A Letter With A Return Address From Fictitious Greendale School In NJ. The Letter Was Loaded With High-Grade, Light, Fine-Textured Anthrax. Three Days Later, 28 Others Are Tested Positive For Exposure. This Letter Comes From The Brentwood Postal Facility Where 2 Workers Will Soon Die From In-Halational Anthrax.
11/2/2001	CDC Reports 21 Anthrax Cases (16 Confirmed, 5 Suspected).
1984	Followers Of The Bhagwan Shree Rajneesh Attempted To Control A Local Election By Infecting Salad Bars In 10 Restaurants With Salmonella Typhimurium In The City Of The Dalles, Oregon.
1991	The Iraqi Government Announces That It Has Conducted Research Into A Number Of Bio-Warfare Agents. Only A Number Of These R&D Facilities Are Destroyed During The Persian Gulf War.
2003	An Outbreak Of The Deadly H5N1 Bird Flu Strain Has Hit Southeast Asia The Hardest, Killing More Than 80 People In Vietnam, Indonesia,Cambodia And Thailand
December, 2004	89 Confirmed Cases With 39 Deaths Have Been Reported To WHO (As Of November 29, 2005). Such Cases Have Occurred In 5 Countries: **Cambodia, China, Indonesia, Thailand, Vietnam & India**
December 2019	Corona and variants

History Of SARS (severe acute respiratory syndrome)

SARS Is A Completely New Infectious Disease Spread By Human Contact And Kills About Four Percent Of The Victims. The Epidemic Originated In Guangdong Province, South China. The Chinese Authority Has Admitted Mishandling The Crisis And To Have Been Slow To Inform Its Citizens.

- The Disease First Struck Last November. In March, Liu Jianlin, 64 Year-Old Medical Professor Who Was Involved In Treating Patients Went From Guangdong To Hong Kong To Attend A Wedding. He Was Taken Ill Soon After Arrival And Admitted To Hospital. He Asked To Be Put Into Quarantine But Was

Ignored Nor Did The Hospital Warn His Contacts. As A Result Nine Guests In The Hotel Where He Stayed Caught The Disease And Carried It To Singapore, Canada, Vietnam And Other Hospitals In Hong Kong.

On 10 February, News Of The Disease Was Posted On Promed, An International E-Mail Notification Service For Infectious Diseases Outbreaks. The Next Day China Informed The World Health Organisation (WHO) But Refused To Let The WHO Team Into Guangdong Until Early April. By 8 April, There Were 2671 Confirmed Cases Of SARSIn 19 Countries And 103 Deaths.

•There Is Some Remaining Doubt However, Whether The Coronavirus Is The Complete Story. John Tam, Director Of Virology At Prince Of Wales Hospital In Hong Kong Found Another Virus, The Human Metapneumovirus In 25 Out Of 53 SARS Patients As Have Laboratories In Canada And Germany. Metapneumoviru Belongs To The Family Paramyxoviridae Which Includes Viruses Responsible For Parainfluenza, Mumps And Measles As Well As The Nipah And Hendra Viruses In Recent Outbreaks.

Coronavirus Showed Up In Only 30 Patients Tested While The Bacterium *Chlamydia* Has Been Identified In All Samples In Hong Kong, Though That Strain Of *Chlamydia* Is Not Known To Cause Disease.

History Of AVIAN FLU

•Events In Recent Years Have Substantially Increased Concerns Regarding Avian Influenza Outbreaks In Humans. Almost All Human Cases To Date Have Occurred Following Bird Or Animal Cases And Result Primarily From Animal To Human Spread.

•A Large And Widespread Epizootic Of H5N1 Avian Influenza Occurred In Poultry Across Southeast Asia , China , Korea And Japan In Early 2004 - 35 Associated Human Cases Occurred In Thailand And Vietnam With 24 Deaths.

New Outbreaks Of H5N1 Influenza In Bird Populations Began Again In Late June 2004 In China, Indonesia, Thailand And Vietnam; Sporadic Human Cases Of H5N1 Infection Occurred In Thailand And Vietnam Subsequently, With 4 Reported Human Deaths Each In Vietnam And Thailand Through October, 2004.

• In The Second Wave, One Instance Of Confirmed Human To Human Transmission Of Avian Influenza Was Reported In Thailand In September, 2004.

•Avian Strains Have Been Shown To Cause Influenza In Humans In A Number Of Other Prior Instances From 1997 Through 2003:

- Hong Kong, 1997, H5N1: 18 People Hospitalized, 6 Deaths. First Evidence Of Bird To Human Spread Of Disease, Limited Human To Human Transmission.
- China And Hong Kong, 1998-1999, H9N2: Disease Confirmed In Two Children, Both Of Whom Recovered. Several Other Cases Reported From Mainland China.

China And Hong Kong, 2003, H5N1: Three Cases In One Family From Hong Kong After Travel To China, Two Confirmed, Two Deaths. Hong Kong, 2003, H9N2, One Patient, Survived.

Avian Flu Surveillance, Prevention Efforts In Asia

•Feb 10, 2005 (CIDRAP News) – Thai Officials This Week Stepped Up Surveillance And Prevention Efforts Against Avian Influenza, Mirroring Events

Taking Place Across Southeast Asia. Thai Authorities Announced They Had 100,000 Doses Of Avian Flu Vaccine In Event Of A Serious Poultry Outbreak In Thailand. More Laboratories Also Have Been Opened In The Country To Speed Testing. Six Thai Provinces Have Been Under Close Scrutiny This Year Owing To Avian Flu Outbreaks Among Chickens. Thousands Of Volunteers Have Gone Door To Door In Villages To Warn People About The Threat Of Another Outbreak And To Teach Them To Protect Themselves With Rubber Gloves And Masks Before Handling Poultry.

•Across The Border In Cambodia, Health Officers Are Conducting Similar Education And Surveillance Activities, The Associated Press (AP) Reported On Feb 9.

• A Radio Station In Southwest Cambodia, The Region That Includes The Home Of Cambodia's First Human Victim Of H5N1, Is Broadcasting Information On Precautions Every Hour, The AP Reported. A 25-Year-Old Woman From Kampot Died From H5N1 On Jan 30 In A Hospital In Vietnam. Investigations Into Her Death Continue

•In China, Authorities Announced They Had Developed Two New Poultry Vaccines For H5N1 Flu. Developers Touted The Vaccine As A Breakthrough In An Asianews Story On Feb. 8. However, A Source Close To The Institute Where The New Vaccines Were Developed Told Asianews That The Vaccines Are Not Different From Existing Products.

•Meanwhile, A Feb 8 Story On The Science And Development Network Web Site Describes The New Vaccines As Longer-Lasting And Safe. Deng Guohua, One Of The Researchers, Said One Of The Vaccines Combines Fowl-Pox And H5N1 Viruses, And Called It Safe For Poultry And Mammals.

China Has Not Reported Any Poultry Outbreaks Of H5N1 To The World Organization For Animal Health Since June 2004.

Works At International Level

♦Interpol Has Hosted A Workshop On The Threat Of Bio-Terrorism In Singapore Gathering Senior Police And Government Officials From 37 Countries Around Asia. A Similar Conference Was Held In South Africa In November, And Another Will Be HeldIn Chile Later This Year.

♦Starting Monday, The Delegates In Singapore Will Discuss Lab Security, Forensic Work And Laws To Pr But More Asian Countries Are Pursuing Biomedical Research Which Can Lead To New Treatments And Concern Is Growing That Laboratory Materials Could Fall Into The Wrong Hands.

♦A Weak Regulatory Environment In China Has Raised U.S. Concerns About Proliferation Of Technologies That Could Be Used To Make Biological Weapons.

♦Last Year, Singapore Passed A Law That Imposes Life In Prison On Anyone Who UsesBiological Agents And Toxins For A "Non-Peaceful Purpose."

Attributes Of Bio-Terrorism-Related Epidemic

In Addition To The Specific Attributes Of Individual Bio-Terrorism Agents, Multiple Considerations Will Shape The Recognition Of A Bio-Terrorism-Related Epidemic. FiveOf These Attributes Follow.

Size

Syndromic Surveillance Would Not Detect Outbreaks Too Small To Trigger Statistical Alarms. Size Would Be Affected By The Virulence Of The Agent, Its Potential For Person-To-Person Transmission, The Extent And Mode Of Agent Dissemination, Whether Dissemination Occurs In More Than One Time Or Place, And Population Vulnerability.

Population Dispersion

How Persons Change Locations After An Exposure Will Affect Whether Disease Occurs In A Concentrated Or Wide Area, And Thus Whether Clustering Is Apparent To Clinicians Or Detectable Through Syndromic Surveillance At Specific Sites.

Health Care

The More Knowledgeable Providers Are About Bio-Terrorism Agents, The Greater The Likelihood Of Recognition. Routine Diagnostic Practices Or Access To Reference Laboratories May Affect The Timeliness Of Diagnosis For Some Diseases. Familiarity With Reporting Procedures Would Increase Prompt Reporting Of Suspected OrDiagnosed Cases

Syndromic Surveillance

Syndromic Surveillance Will Be Affected By The Selection Of Data Sources, Timeliness Of Information Management, Definition Of Syndrome Categories, Selection Of Statistical Detection Thresholds, Availability Of Resources For Follow Up Recent Experience With False Alarms And Criteria For Initiating Investigations.

Season

A Fifth Key Attribute Is Seasonality. An Increase In Illness Associated With A Bioterrorism Attack May Be More Difficult To Detect If It Occurs During A Seasonal Upswing In Naturally Occurring Disease.

Agent

Disease-Specific Attributes May Be Among The Most Important Factors Affecting Detection And Diagnosis The Incubation Period And Its Distribution In The Population Will Affect The Rate At Which New Cases Develop And Thus How Quickly An Alarm Threshold Is Exceeded Or Whether Clinicians Recognize A Temporal And Geographic Cluster. If A Disease Has A Short Prodrome, The Chance Is Increased That A Patient Would Be Hospitalized And A Definitive Evaluation Initiated Before An Increase In Cases Triggered A Surveillance Alarm. Alternatively, If A Disease Has A Relatively Long Prodrome, Chances Are Greater That Prediagnostic Events (E.G., Purchase Of Medications Or Use Of Outpatient Care For Nonspecific Complaints) Would Accrue To Levels That Exceed Syndromic Surveillance Thresholds, Before Definitive Diagnostic Evaluations Are Completed Among Patients With More Severe Disease. Arousing Clinical Suspicion For A Particular Diagnosis Will Depend On The Specificity Of The Early And Late Stages Of Illness As Well As The Presence Or Absence Of A Typical Feature That Should Alert Clinicians To The Diagnosis, Such As Mediastinal Widening In Inhalational Anthrax. If A Routinely Performed Test Is Apt To Be Diagnostic In A Short Time (E.G., The Blood Culture In Anthrax), A Rapid Diagnosis Is Likely Even In The Absence Of Clinical Suspicion. If Routine Tests Are Unlikely To Yield A Rapid Diagnosis (E.G., The Blood Culture For The Cause Of Tularemia, *Francisella Tularensis* Or If The Diagnosis Requires A Special Test (E.G., The Hemorrhagic Fever Viruses, A Diagnosis May Be Delayed If Not Immediately Considered.

The Public Health Benefit Resulting From Early Detection Of An Epidemic Is

Likely To
Vary By Disease. If A Disease Has A Relatively Wide Distribution Of Potential Onsets, Early Recognition Provides Greater Opportunity To Administer Prophylaxis To Exposed Persons. For Example, Based On Data From The Sverdlovsk Incident Brookmeyer And Blades Estimated That Use Of Antibiotic Prophylaxis During The 2001 Anthrax Outbreak Prevented Nine Cases Of Inhalational Disease Among Exposed Persons.If The Incubation Period Of A Disease Has A Relatively Narrow Distribution, Early Recognition May Offer Little Opportunity For Postexposure Prophylaxis, Although A Potential Benefit Would Remain For Alerting Healthcare Providers And Informing Their Care Of Others With Similar Symptoms. This Pattern Of Illness Is Apt To Result From Exposure To An *F. Tularensis* Aerosol, Which Would Likely Result In An Explosive Epidemic With An Abrupt Onset And Limited Duration

Preparedness To Face Bio-Terrorism:

In No Part Of The World, The Public Health And Medical Authorities Are Adequately Geared Up To Detect And Respond To Biological Hazards, Natural Or Inflicted By Bio-Terrorists. Almost All The Developing Countries Are Virtually Totally Unprepared Against Bio-Terrorism. There Is A Lack Of Scientific Awareness, Preparedness And Funding. Stocks Of Antibiotics And Vaccines Against Known Pathogens That Are Essentially Needed Are Inadequate To Meet With Even The Periodical Natural High Incidence, Let Alone In The Event Of A Bio-Terrorist Attack. The Situation Is Worse In The Developing Countries. The Havoc Caused By The Plague Epidemic That Caught Everyone Napping, In Surat In India A Few Years Ago, Is A Recent Example.

The Degree Of Damage An Organism Or A Toxin Can Inflict Varies Widely And This Also Depends Upon The Socio-Economic Status Of The Country Or Sections Of Her Vulnerable Population. Although Anthrax Is Much In The News Currently, It Is A Poor Biological Weapon And Can Cause Only A Localised Damage, As It Is Primarily Not A Prevalent Human Disease And It Is Not Contagious. Diseases That Spread Through Food And Water (Or By Human Contact) Cause A Far Greater Damage Among The Poorer Sections Of The Population Of Any Country.

Some Aspects Of Preparedness Against Bio-Terrorism Are Similar To Those Needed To Face Natural Disasters Like Cyclones, Floods And Earthquakes, As Epidemics Often Follow Such Disasters. We Should Act In Advance And Not After The Disaster Strikes, As We Usually Do. Some Urgent Measures In This Regard Are.

1.Public Awareness: It Is Reasonable To Expect That The Bio-Terrorist Would Choose A Particular Disease For Use In A Particular Country, And May Even Target A Particular Segment Of The Population Of That Country. For Example, A Human Pathogen Can Be Transmitted Through Susceptible Or Carrier Bovine Hosts To Affect Beef Eaters. People Can Be Affected By The New Variant Of Creutzfeldt-Jacob's Disease (Nvcjd), A Prion Disease, On Consumption Of Food Contaminated With The Mad Cow Disease (Bovine Spongiform Encephalopathy). Public Health And Medical Authorities Should Identify The Probable Diseases And The Means Of Their Spread, And Make The Public Aware Of These Possibilities. Public Should Also Be Made Aware Of The Precautionary Measures To Be Taken And The Methods Of Management Of The Diseases, When They Appear. Facts About Different Diseases Of Bio-Terrorist Import Should Be Publicised, The Way Centres For Disease Control And Prevention In US Do. All This Is Not A Small Task In Countries With Large Illiterate Populations But An Infrastructure To Achieve This

Must Be Built Up, Without Loss Of Time.

2.Research And Development: We Need Adequate Number Of Well Equipped Labs

With Facilities For Microbiologists To Develop Quick And Certain Means To Identify The Pathogen And The Disease, For Biochemists To Develop Diagnostic Kits, For Pharmacologists To Develop Drugs And For Immunologists To Produce Vaccines. In Every Country There Is Some Activity Of This Nature But It Is Not Adequate.

3.Stockpiling Vaccines And Drugs: We Need Very Large Stocks Of Vaccines And Drugs For Different Diseases In Times Of Disaster. Authorities Should Identify The

Vaccines And Drugs That Would Be Required To Meet The Eventuality And Advice The Manufacturing Units To Produce The Required Quantities. Care Should Be Taken That The Drug Manufacturers Do Not Exploit The Situation By Hiking The Prices, As SeemsTo Have Happened With Anti-Anthrax Drugs Recently.

4. Bio-Defence Research Must Continue Both To Provide Improved Drugs And Protective Measures To Deal With Normal Illness, As Well As To Prepare Us To Face A Bio-Terrorist Attack. One May Argue That We Should Expect The Unexpected, But That Is Not Always Possible, And Certainly Not All The Time, And Not Forever. We Should Not Forget That The Degree Of Success Of A Terrorist Attack Lies In The Element Of Surprise, In Terms Of The Place, Manner And The Time Of The Attack. Almost Certainly, There Will Be No Bio-Terrorist Attack Where And When We Are Prepared.

5. Contingency Plan Of Action: Authorities Should Draw Contingency Plans Of Action, Separately For Each Vulnerable Area, To Meet With The Situation When It Develops, And Identify The Hospitals, Health Care Units, Doctors And Para-Medical Personnel And Prepare Them To Face The Situation.

6. Keep Watch On Plants As Sensors: Recently, Publicly-Funded Research Has Been Approved To Create Genetically Modified Plants As An Easily Producible Early Warning System. The Plants Would Be Modified To Change Color When In Contact With A Predetermined Chemical Or Biological Agent, And Would Be Distributed In Public Places To Provide A Monitoring Grid Capable Of Detecting The Spread Of A Contaminant.

7. Setting Up Local Emergency Rooms And Offices To Immediately Deal With The Outcome In Case Of An Attack.

8.Performing Mass Decontamination On Victims Or Potential Victims (Persons Suspected Of Harboring Contamination That They Might Knowingly Or Unknowingly Spread To Others) Quarantine To Prevent The Spread Of Disease, Or Temporary Quarantine For Decontamination.

9.Instruction And Training For Local Communities Protective Clothing For Military Personnel Locating Persons Buying Biological Warfare Materials.

10.Vaccination Of People Before They Are Exposed. However, Vaccines Are Not Considered To Be A Perfect Solution. A Bioterrorist Could Develop Novel, Possibly Artificial, Pathogens Against Which Conventional Vaccines Would Be Useless.

11. Researchers Should Look For Ways Of Developing Vaccines Quickly Enough For Them To Be Created, Mass-Produced And Distributed After An Attack. This Would Require Significant Progress In DNA Sequencing So That An Unknown Pathogens' Genes Could Be Decoded Quickly. The Resulting Sequences Could Help In The Development Of A DNA Vaccine. Another Major Issue With

Vaccines Is That They Sometimes Have Dangerous Side-Effects, A Massive Inoculation Program May Result In Deaths And Illness Which Would Be Unnecessary If No Biological Attack Occurs. This Concern Has Been Raised With Modern Anthrax Vaccines. The 1976 Swine Flu Scare Highlights The Dangers Of The Mass- Vaccination Approach.

12. **Research And Development Needs A** System Is Needed To Ensure That Medical Facilities Receive Information On Actual, Suspected, And Potential Terrorist Activity. Research May Be Necessary To Determine What Should Be Communicated, To Whom It

Should Be Communicated And Even Whether The System Should Vary By State And City, But It Must Include Links To The Law Enforcement Community.

13. **Find Ways To Adapt New And Emerging Detection Technologies** To The Spectrum Of Chemical And Biological Warfare Agents. First Responders, Emergency Medical Personnel, And Public Safety Officials, All Need Improved Instrumentation For Detecting And Identifying Chemical And Biological Agents In Both The Environment And In Clinical Samples From Patients. The Watchwords Are Simplicity, Speed, Cost, Sensitivity And Specificity. The Key To Widespread Purchase And Uses Lies With Identifying A Wide Spectrum Of Toxic Substances, Including But Not Limited To Military Agents.

Work On Symptom-Based Tools For Identifying Unknown Toxic Agents, Including But Not Limited To, Military Chemical Weapons, Is An Area Where Benefits May Extend Well Beyond Response To Terrorist Acts.

14. **Complete Information Is Needed On The Toxicity** And Adverse Health Effects That Could Result From Acute Exposure To Low Levels Of Agents, Especially In Sensitive Populations, Such As The Young, The Elderly And Those In Ill Health. This Information Is Necessary To Develop Guidelines (For Example, Susceptible Human Exposure Levels) For Safe And Effective Evacuation, Decontamination, And Other Protective Action. Methods Are Needed For Rapid, Effective, And Inexpensive Decontamination Of Large Groups Of Personnel, Equipment And Environment.

15. **Approaches To Treatment** Are Needed That Have Utility Beyond Terrorism Or Chemical And Biological Warfare. Vaccines, Or Drugs Aimed At Families Of Pathogens Or Toxins, Substances To Bind Toxic Molecules Before They Reach Their Site Of Action And Perhaps Even Existing Drugs And Other Chemicals That Can Serve As Expedient Treatment (For Example, Anticholinergics Other Than Atropine), Are ToBe Identified.

16. **Complete Information Is Needed On Possible Interactions** Of Antidotes And Therapeutic Drugs With Anti-Hypertensives, Psychotherapeutics, Anti-Inflammatory Compounds, Immuno-Suppressants, And Other Medications In Widespread Public Use. There Is A Need For Evaluation Of Interventions For Preventing Or Ameliorating Adverse Psychological Effects In Emergency Workers, Victims, And Near-Victims. Examination Of The Japanese Experience Following The Release Of Sarin On The Tokyo Subway, Other Acts Of Terrorism (Recent Threat Of Anthrax In The US), And Unintentional Releases Of Toxic Chemicals (The Bhopal Gas Tragedy) Would BeEspecially Valuable.

17. **Risk Assessment/Threat Perception** By Individuals And Groups, And On

Risk Communication By Public Officials, Especially The Roles Of Both The Mass Media And The Internet In The Transmission Of Anxiety (Or Confidence). Some Information Is Available Of Pollutants And Toxic Waste, But There Is Little Or No Systematically Collected Data On Fears And Anxieties Related To The Possibility Of Purpose Fully Introduced Disease.

18. **Standardised Protocols For Follow-Up Of First Responders**, Healthcare Providers And Victims Are Required, For Improving Care Of Those Individuals, For Improving Medical Response To Future Incidents, And For Improving Risk Assessments.

19. **Interim Recommendations** The Committee Considered It Irresponsible To Focus Solely On Technology R&D That Requires Elaborate And Meticulous Planning And Is

Both Time Consuming And Expensive. Hence, The Committee Made Eight Recommendations Involving Potentially Simpler, Faster Or Less Expensive Mechanisms Than R&D Of New Technology. These Are Slightly Modified Here For The Use Of The Developing Countries, Which Should Make A Beginning With These Recommendations And Also Take Up The R&D Measures, Simultaneously.

1.Provide Financial Support For Improvements In State And Local Surveillance Infrastructure, Such As Poison Control Centres And Communicable Disease Programmes.

2.Survey Major Metropolitan Hospitals For Supplies Of Antidotes, Drugs, Ventilators, Personal Protective Equipment, Decontamination Capacity, Mass-Casualty Planning And Training, Isolation Rooms For Infectious Disease, And Familiarity Of Staff With The Effects And Treatment Of Chemical And Biological Weapons.

3. Encourage The Governmental And Private Agencies Engaged In Health And Medical R&D To Share Their Information On Diseases And Drugs And On The Location And Owners Of Dangerous Biological Materials. State Health Departments In Turn Should Be Encouraged, By Education Or Training, On The Effects Of Agents And Medical Responses Required, To Add Infections By These Materials To Their Lists Of Reportable Diseases.

4. Provide Support To The Army's Efforts To Test Commercial Personal Protective Equipment For Protection Against Nerve And Vesicants.

5.Convene Discussions Among The Appropriate Agencies On The Use Of Investigational Products In Mass-Casualty Situation And On Acceptable Proof Of Efficacy For Products Where Clinical Trials Are Not Ethical Or Are Otherwise Impossible.

6. Develop Incentives For Hospitals, Both Public And Private, To Be Ambulance Receiving Hospitals, To Stockpile Nerve-Agent Antidotes And Selected Antitoxins And Put Them In The Hands Of First Responders, By Changing Laws If Needed, To Purchase Appropriate Personal Protective Equipment And Expandable Decontamination Facilities And Train Emergency Department Personnel In Their Use.

7. Provide For State And Central Training Initiatives With A Programme To Incorporate Existing Information On Possible Chemical And Biological Terror

Agents And Their Treatment Into The Manuals And Reference Libraries Of First Responders, Emergency Departments And Poison Control Centres. Professional Societies And Journal Publishers Should Be Recruited To Help In This Effort.

8. Intensify Public Health Service Efforts To Organise And Equip Urban Medical Strike Teams, In High-Risk Cities Throughout The Country.Although These Teams Are To Be Primarily Designed To Cope Up With Terrorism, Using Local Personnel And Resources, They Also Increase The Community's General Ability To Cope With Industrial Accidents And Other Mass-Casualty Events.
9. The Most Important Point To Remember If You Suspect That You May Have Been Exposed To A Bio-Terror Attack Is To Seek Immediate Medial Attention By Going To The Emergency Room At A Hospital. Most Hospitals Have Personnel That Have Been Trained To Respond To A Bio-Terror Attack, And They Know What To Do To Reduce Your Risk Of Dying Or Becoming Permanently Incapacitated. In Contrast To Your Personal Physician, Most Hospital Emergency Personnel Have Received Some Type Of Training On How To Respond To Biological Emergencies. Take With You A List Of

Where You Have Been For The Previous Several Days, Which You Have Come Into Close Contact With, Your Signs And Symptoms And What You Think Might Be The Source For Your Medical Problem. Also Include Any Previous Medical Problems, Medications That You Are Currently On And Anything Else That Would Help Hospital Personnel Deal Quickly And Effectively With Your Problem.

10.Finally, In The Extremely Unlikely Event That You Or A Member Of Your Family Becomes Exposed To A Potential Bio-Terror Or Biological Agent, It Is Important To Carefully Watch The Other Members Of Your Family For The Appearance Of Similar Signs And Symptoms. Speed Is Of Utmost Importance In Counteracting The Agents Listed Above. It Is Better To Be Ridiculed For Acting Unnecessarily Than To Not Act At All If You Feel That You Or Someone Close To You May Have Been Exposed To A Biological Agent.

Preventive Measures And Treatment Procedures Of Bio-Terror Antibiotics

The Biological Agent Was Bacterial And Susceptible To The Antibiotic Chosen For Chemo-Prophylactic Use. In Addition, Long-Term Use Of Antibiotics Can Have Their Own Problems. Some People Cannot Take Ciprofloxacin Because Of Allergic Reactions (Hypersensitivity Or Anaphylactic Reactions). For Example, Ciprofloxacin Therapy May Result In Drug Crystals In The Urine In Rare Cases And Patients Should Be Well Hydrated To Prevent Concentration Of Urine. Adverse Antibiotic Responses Resulted In Discontinuing Ciprofloxacin In ~3.5% Of Patients, And Such Reactions Included Nausea (5%), Diarrhea (2%), Vomiting (2%) Abdominal Pain (1.7%), Headache (1.2%) And Rash (1.1%). In Rare Cases Cirprofloxacin May Cause Cardiovascular Problems (<1%) And Central Nervous System (Dizziness, Insomnia, Tremor, Confusion, Convulsions) And Other Reactions (<1%). Pregnant Women And Children Should Not Use This Drug Due To Reduction In Bone And Cartilage Development. Although Some Practitioners Have Suggested That Lower Doses Could Be Used For Children, This Antibiotic Has Not Been Approved For Pediatric Use. Doxy-

Cycline Has Lower Adverse Responses And Is Just As Effective Against Almost All Anthrax Strains. However, In A Few Patients Doxy-Cycline Causes Gastrointestinal Irritation, Anorexia, Vomiting, Nausea, Diarrhea, Rashes, Mouth Dryness, Hoarseness And In Rare Cases Hypersensitivity Reactions, Hemolytic Anemia, Skin Hyper-Sensitivity And Reduced White Blood Cell Counts. Doxycycline Can Be Used At Low Dose In Children Aged 7 And Above, Mostly Because Of The Chance Of Tooth Discoloration In Younger Children. Azithromycin Is The Antibiotic Of Choice For Pediatric Cases, But Its Cost Generally Prevents Widespread Use. Adverse Antibiotic Responses Were Mild To Moderate In Clinical Trials And Included Diarrhea (5%), Nausea (3%), Abdominal Pain (3%). In Rare Cases (<1%) Azithromycin May Cause Cardiovascular Problems (Palpitations, Tachycardia, Chest Pain) And Central Nervous System (Dizziness, Headache, Vertigo), Allergic (Rash, Photosensitivity, Angioderma), Fatigue And Other Reactions (<1%). In Pediatric Patients >80% Of The Adverse Responses Were Gastrointestinal. In Children, Doses Above The Suggested 10 Mg/Kg/Day Have Been Shown To Produce Hearing Loss In Some Patients. Penicillin Has Been Recommended For Some Types Of Bio-Terror Agents, Such As Anthrax. For Example, Amoxicillin, A Semi-Synthetic Type Of Ampicillin, Can Cause Fatal Anaphylactic Responses In Patients Allergic To Penicillin, Gastrointestinal Problems (Nausea, Vomiting, Diarrhea Colitis) In Some Patients, And Rarely Anemia And Changes In White Blood Cell Count. These Are Usually Reversible On Discontinuation Of Therapy. As A Relative Safe Preventive Alternative, Especially In The Absence Of A Confirmed Exposure, Immune Enhancers Have Been Recommended.

Antiviral

Use Of Anti-Virals Against Viral Agents Should Only Be Done Under The Direct Care Of A Physician, And Their Use Is Only Recommended After A Confirmed Infection. They Are Not Recommended For Chemo-Prophylactic Use Due To A Relatively High Rate Of Complications And Adverse Reactions Compared To The Commonly Used Antibiotics Listed Above. Some Anti-Virals Have To Be Given Intravenously, And This Can Only Occur In A Supervised Clinical Setting. Cost And Availability Are Factors That Severely Limit Their Use, And Almost All Cannot Be Used In Pregnant Women And Some Cannot Be Used For Children. Certain Nutraceutical Treatments Can Be Used Instead Or Concurrently Such As Genistein (In Soy/Red Clover) To Inhibit Viral Kinase, Rosemary/Lemon Balm To Reduce Complement Activation, Selenite (See Below) To Inhibit Viral Replication, Barley Grass And Lauric Acid To Inhibit Lipid Metabolism Of Viruses And ***Phyllanthus*** *Amarus/Niruri* To Inhibit Viral Reverse Transcriptase. The Efficacy Of These Supplements In Preventing Infection By Bioterror Viral Agents Is Not Known.

Vaccines

Specific Vaccines Can Potentially Protect Against Bacterial And Viral Bioterror Agents. Most Of These Vaccines Would Have To Be Administered Over A Relatively Long Time Period To Be Effective. For Example, The Current Anthrax Vaccine Must Be Administered In Multiple Doses Over An 18-Month Period To Be Effective And It Is Not Even Known Conclusively That The Vaccine Is Effective Against Inhalation Anthrax. This Vaccine Is Not Recommended For Civilian Use Due To The Relatively High Rate Of Adverse Reactions Including

Fatalities And Autoimmune Diseases That Have Resulted From Its Use. Other Vaccines Such As The Smallpox Virus Vaccine, Have Been In General Civilian Use For Some Time And Are Relatively Safe. New Generations Of These Vaccines Are Under Development But They Will Not Be Available For Some Time, Possibly Years.

Passive Immunization

Passive Immunization By Administration Of Immune Sera Containing Antibodies Against Specific Bio-Terror Agents Is A Costly Alternative That Can Only Be Used After A Confirmed Exposure. Newer Developments Include Passive Immune Sera Or Pure Antibodies That Can Target Toxin Molecules Themselves Instead Of The Microorganisms. For Example, Antibodies Against The Anthrax Lethal And Bloat Factors (The Lethal Toxins) Or Their Protective Factor (A Transport Factor Needed To Transport The Lethal Toxins Into Cells) Can Potentially Stop A Fatal Form Of Systemic Anthrax. Unfortunately, These Approaches Are For The Most Part Experimental And Are Not Widely Available.

Immune Enhancement And Nutrition

Immune Enhancement And Nutritional Approaches Are Not Expected To Be Full-Proof Preventive Measures That Will Completely Protect Against Bioterror Agents. However, A Healthy Immune System Is The First Line Of Defense Against Microorganisms And May Determine The Severity Of Illness Caused By Infections. Proper Nutrition Is Essential For A Healthy Immune System. Unfortunately, Most People Do Not Have Good Nutritional Habits, And They Would Be Prudent To Supplement Their Diets With Certain Vitamins (*Especially* B-Complex, C, E, Coq-10) And Minerals, Such As Zinc, Magnesium, Chromium And Selenium. Also, Patients Undergoing Treatment With Antibiotics And Other Substances Risk Destruction Of Normal Gut Flora That Provide Important Digestive Enzymes For Processing Food In The Gut. Antibiotic Use That Depletes Normal Gut Bacteria And Can Result In Over-Growth Of Less Desirable Bacteria. To Supplement Bacteria In The Gastrointestinal System Live Cultures Of ***Lactobacillus Acidophilus*** In Capsules Or Powder Are Strongly Recommended. A Number Of Natural Remedies, Such As Ginseng Root, Herbal Teas, Lemon/Olive Drink, Olive Leaf Extract With Antioxidants Fresh Or Deorderized Garlic And Oregano Oil (In Enteric Coated Capsules), Among Others, Have Been Shown To Be Useful For Immune Support, Especially During Or After Antibiotic Therapy. Some Additional Remedies Are: Olive Leaf Extract, Lactoferrin And Other Natural Plant Products Or Herbal Mixtures. Other Important Examples Of Immune Support Are Immune Modulators, Such As Bioactive Whey Protein, Transfer Factors And Other Colostrum-Derived Products And Plant Glucans. Good Immune Boosters Have Been Isolated From Mushroom Extracts And Are Widely Available From A Number Of Manufacturers. These Products Have Been Used To Maintain Or Boost Immune Systems To Prevent Infections.

Conclusion

The Most Likely Target For Bio-Terrorism Is A Major City Or Other Densely Crowded Areas, Such As Transportation Hubs, Major Sports Events Or Public Rallies And Especially Government Buildings. Although Recently Even Civilians

In Remote Areas Were Frightened Enough To Seek Medical Attention For What They Perceived Was A Bio-Terror Attack, In Reality An Attack In A Remote Area Would Be Extremely Unlikely. In High Population Density Areas, The Ventilation Systems In Large Buildings Might Be Especially Temping Targets, As These Are Rarely Protected. As We Have Seen, Practically Any Delivery System Can Be Used To Penetrate An Office Building, Even A Letter Delivered By The Postal Service. Once An Attack Has Occurred, Most Biological Agents Would Need An Incubation Period Of Several Days In Order To Cause Sickness. This Has The Advantage Of Allowing A Bioterrorist Time To Escape Or Perform Undetected Other Acts Of Terrorism. Thus A Single Bioterrorist Could 'Hit' Several Targets Long Before An Attack Was Suspected. Even With Large Numbers Of People Exhibiting Nonspecific Signs And Symptoms Within A Few Days After An Attack, It Would Take Some Time For The Medical Community To Recognize These Events As A Bioterror Attack. This Is Primarily Due To The Expected Dispersed Nature Of Patients Seeking Medical Attention At Different Institutions And At Different Times. The Recent Outbreak Of Inhalation Anthrax In Florida And Cutaneous Anthrax In New York In The First Week Of October 2001 Might Be An Example Of A Fairly Restricted .

Bioterror Attack. In This Case A Very Modest Amount Of Anthrax Spores Caused Only A Few Casualties And One Death But Caused Tremendous Panic In The Local Populous. Early Reports From Government Agencies Were Directed At Restoring Public Confidence By Reassuring People That This Was An Isolated Incident And Denying That A Potential Bioterror Attack Had Even Occurred. Later Authorities Had To Admit That An Attack Had Indeed Occurred. The Lesion Was That We Should Not Expect Authorities To Be Immediately Candid About A Bioterror Attack. Bioterrorism Does Not Have To Cause Large Numbers Of Immediate Deaths To Be Effective. Most Biological Agents Do Not Cause Widespread Immediate Fatalities Or Even Large Numbers Of Deaths Within Days Of Exposure And Most Exposed Patients Might Not Even Have A Life-Threatening Disease. The Main Functions Of Bioterrorism Are To Cause Panic, Disruption And Chaos, So Biological Agents Don't Have To Cause A Fatal Disease To Be Effective. In Fact, Many Biological Warfare Agents Are Categorized As 'Incapacitating Agents' That Are Not Intended To Produce A Fatal Disease.They Are More Effective If They Incapacitate And Produce Strain On A Health Care System By Having Many Thousands Of Sick Patients Inundate Treatment Facilities That Contain Only Limited Quantities Of Drugs And Only A Few Isolation Beds. Also, It Is Much Easier To Spread An Incapacitating Agent From Person To Person Because It Would Not Cause Enough Alarm To Require Quarantining Of Exposed Persons, Which Could Limit Additional Exposure.

References:

1 Chemical And Biological Terrorism: Research And Development To Improve Civilian Medical Response. 1999. Committee On R&D Needs For Improving Civilian Medical Response To Chemical And Biological Terrorism Incidents. Institute Of Medicine, US, National Academy Press.

2 Firepower In The Lab: Automation In The Fight Against Infections, Diseases And Bioterrorism. 2001. Solt, P Layne, J. Beugeldijk, And C Kumar N. Patel (Eds.). Joseph Henry Press.

3. Vietri N. J. Et Al, A Short Course Of Antibiotic Treatment Is Effective In

Preventing Death From Experimental Inhalational Anthrax After Discontinuing Antibiotics, The Journal Of Infectious Diseases 2009.

4. *Bioterrorism Overview*, Centers For Disease Control And Prevention, 2008-02-12, Retrieved 2009-05-22.
5. Of Biologics As Weapons Bioterrorism: A Threat To National Security Or Public Health Defining Issue? MM&I 554 University Of Wisconsin–Madison And Wisconsin State Laboratory Of Hygiene, September 30, 2008.
6. Joy, Bill (2007-03-31), *Why The Future Doesn't Need Us: How 21st Century Technologies Threaten To Make Humans An Endangered Species*, Random House,ISBN 978-0-553-52835-0

Websites

1. Http://Www4.Nationalacademies.Org/News.Nsf/
2. Http://Www.Medscape.Com/Medscape/Features/Resourcecenter/Bioterr/
3. Http://Books.Nap.Edu/Books/N1000850/Html/52/Html
4. Http://Www.Cdc.Gov/